Sept. 8, 1936. H. K. POWELL ET AL 2,053,686

COLLAPSIBLE PAPER CONTAINER

Original Filed Oct. 3, 1930

Fig. 1.

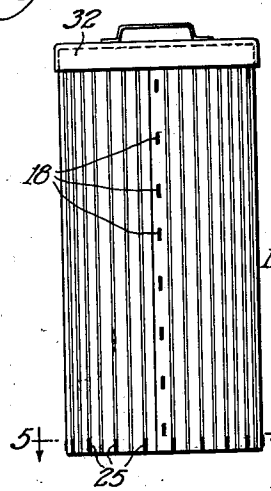


Fig. 3.

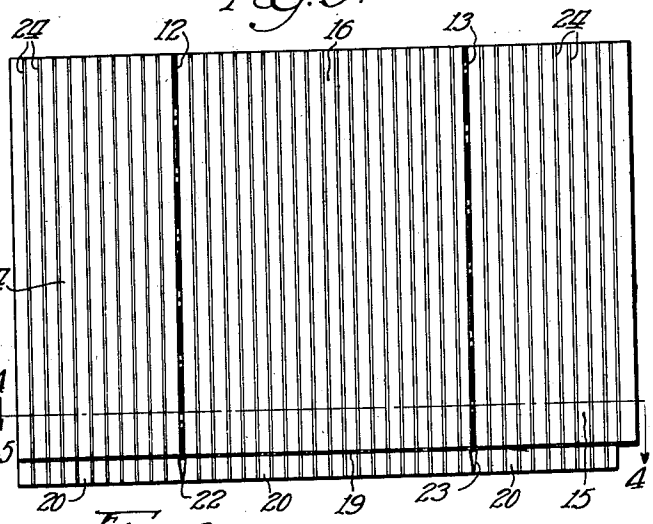


Fig. 2.

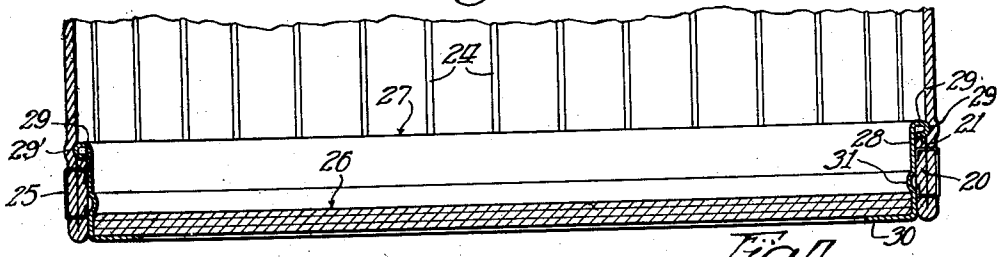


Fig. 4.

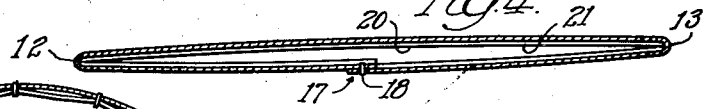


Fig. 5.

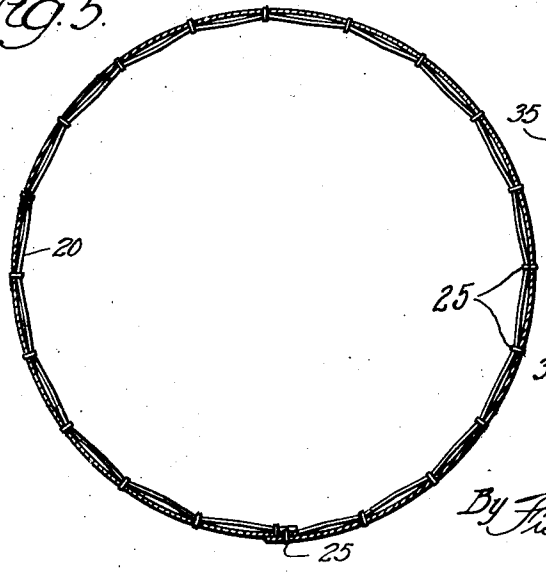


Fig. 6.

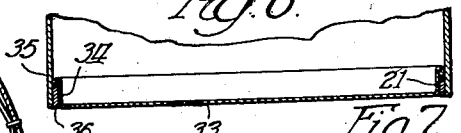
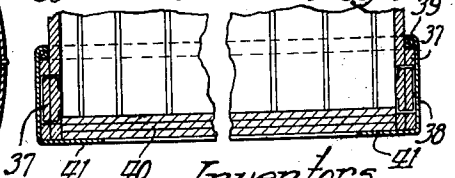


Fig. 7.



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Patented Sept. 8, 1936

2,053,686

UNITED STATES PATENT OFFICE

2,053,686

COLLAPSIBLE PAPER CONTAINER

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Application October 3, 1930, Serial No. 486,135
Renewed January 7, 1935

13 Claims. (Cl. 229—5.5)

Our invention relates to collapsible paper containers and more particularly to the construction of large sized ice cream cans and the like, for example, five gallon ice cream cans.

One of the main objects of our invention is to provide a large sized collapsible paper container of the class described which will be strong and sufficiently rigid for its intended purpose, and which will be reinforced at its lower end so as to be capable of withstanding such rough handling as containers of the type mentioned sometimes receive. Another important object is to provide a collapsible can of the class described which may be manufactured in separate parts and which parts may be easily and quickly assembled to set up the container for use, but which parts may be stored and transported in a substantially flattened, collapsed or knocked-down condition.

Other objects and advantages of our improved collapsible container will be understood by reference to the following specification and accompanying drawing in which we have illustrated an ice cream can embodying a preferred form of our invention.

In the drawing:

Fig. 1 is a side elevation of an ice cream can,

Fig. 2 is a fragmentary section on a plane extending substantially diametrically through the can at its lower end,

Fig. 3 is a plan of the paper blank which forms the body of the can,

Fig. 4 is a section on the line 4—4 of Fig. 3, but showing the blank with its opposite side edges united to form the tubular can body, the body being shown in collapsed condition,

Fig. 5 is a section similar to Fig. 4 but showing the parts as they appear when the body is distended to substantially cylindrical form, and

Figs. 6 and 7 are sections of modified forms of the bottom of the can.

Referring now to the drawing, our improved container comprises a main tubular body 10 formed of a paper blank 11 such as illustrated in Fig. 3. The blank 11, for a five-gallon ice cream can, for example, is preferably formed of a paraffin-coated paper board of suitable thickness, for instance, about $\frac{1}{16}$ of an inch.

The blank 11 is provided with a pair of main fold lines 12 and 13 which may be formed by creasing or otherwise treating the blank so as to facilitate folding the opposite side portions 14 and 15 inwardly over the intermediate portion 16. The combined width of the side portions 14 and 15 is somewhat greater than the width of the intermediate portion 16 so that the outer marginal portions of the sections 14 and 15 will overlap when folded as indicated at 17 in Fig. 4. The overlapping marginal portions are united by suitable means, for instance, by stapling as indicated at 18.

The blank 11 is also provided with a transversely extending fold line or crease 19 which is spaced upwardly a short distance from the lower edge of the blank. The lower marginal strip of the blank which is set off by the fold line 19 is adapted to be folded back on the blank on the inside thereof so as to form a two-ply portion in the lower end of the can body. This two-ply portion constitutes a reinforced lower end of the body, and the upwardly and inwardly turned marginal strip portion 20 serves to provide an upwardly facing internal shoulder 21 in the can body at a point spaced upwardly from the lower end of the body. To facilitate rebending of the marginal portion 20 of the blank either before or after the opposite sides of the blank are united to form the tubular body, and to permit unhampered collapsing of the body when the marginal portion is rebent, the marginal portion 20 is notched out or slotted in inverted V-form as indicated at 22 and 23 in alignment with the fold lines 12 and 13 respectively. Because of the V-form of the notches, the internal shoulder will be practically continuous inasmuch as the shoulder forming end of the marginal portion is, in effect, not affected by the notches.

The tubular body is adapted to be collapsed to a substantially flat condition as indicated in Fig. 4. To facilitate such collapsing and the distention of the tubular body to substantially cylindrical form, we provide the body blank 11 with a plurality of fold lines or creases 24 which extend longitudinally of the body and are spaced uniformly around the circumference of the same. By "fold lines" or "creases" we refer to narrow strips of the body blank which, by localized application of pressure, are offset slightly from the plane of the blank without materially cutting or lessening the thickness of the blank in such creases. Preferably, the creases 24 extend through the lower marginal portion 20 so as to facilitate bending of the same incident to the collapsing of the body and/or distention thereof to tubular condition.

When the tubular body is distended from collapsed condition as shown in Fig. 4 to substantially cylindrical condition as shown in Fig. 5, it will be noted that the inner bottom marginal portion 20 assumes a curvature of lesser radius than that

of the can body proper. In so doing certain parts of the marginal portion 20 may buckle with respect to the outer body portion. This feature may be taken advantage of by more or less controlling the buckling of said marginal portion so as to form a somewhat resilient or yielding structure at the bottom of the can body for snugly receiving the bottom structure which will presently be described. To control the buckling in the manner just indicated, we secure the rebent marginal portion 20 to the main body by suitable means, for instance, staples 25, these staples being located at alternate creases of the series of light creases 24, thereby leaving the rebent marginal portion 20 free at the intermediate alternately disposed light creases. When the rebent portion 20 is secured in the manner described, it is found that the unsecured intermediate portions of the rebent margin 20 tend to buckle inwardly in the manner illustrated in Fig. 5, thereby forming a series of resilient or outwardly yieldable corrugations around the inside bottom of the tubular body.

The bottom closure for our improved container includes in this instance a heavy paper bottom member 26 which may be formed as a one-piece member or as a composite member consisting of a plurality of layers of paper board united in any suitable manner, for instance, by stapling. The bottom member 26 is also preferably coated with paraffin so as to render the same impervious. The bottom closure includes also an annular metallic member 27 which comprises a side wall portion 28 having its upper edge turned outwardly to form a rim 29 which overlies the shoulder 21. At its lower edge, the side wall portion 28 is provided with an inwardly extending bottom flange 30 which constitutes a seat for receiving and supporting the bottom member 26. The outside diameter of the rim 29 of the annular member 27 is preferably slightly greater than the inside diameter of the can body. The mounting ring may be inserted into the can body from the top thereof, in an inclined position, and forced into the position illustrated wherein the rim bead 29 rests on the shoulder 21 and also expands the body sufficiently as shown at 29' to form an interlock between the body and the mounting member 27 which serves to effectively prevent displacement of the mounting member. The mounting member may be inserted into the body of the can either before or after the bottom member 26 is placed in position and being comparatively rigid in itself is effective to hold the tubular body in distended, cylindrical form. The bottom member 26, being formed of heavy paper board, is also in itself quite rigid and serves to reinforce the annular member 27 and to assist the latter in maintaining the can body in its distended condition.

The side wall 28 of the annular bottom mounting member 27 is preferably provided with an inwardly projecting annular hump or shoulder 31 and the bottom member 26 is preferably of such size that it will be necessary to flex the same when forcing it past the said inwardly projecting hump 31 to its seated position on the flange 30. It will be readily understood that the bottom member 26 may be flexed in the manner just indicated though made of a stiff commercial grade of paper board. The thickness of the bottom member 26 is preferably such that it will fit snugly between the flange 30 and the overhanging inward hump 31 as indicated in Fig. 2 and the diameter of the bottom member is also preferably such that it will fit snugly within the bottom portion of the side part 28 of the mounting member.

While it is preferable to form the annular mounting member 27 of such a diameter that it will fit snugly within the rebent marginal portion 20 of the can body, still it is not imperative that an extremely snug fit be provided inasmuch as the inwardly buckled marginal portion 20 is somewhat expansible as previously pointed out. Hence, an undersized mounting member (within certain limits) may be used without impairing the efficiency of our improved construction, especially when the contents of the can is more or less solid material such as ice cream. It may also be noted that because of the numerous creases 24 and the main folding creases 12 and 13, a certain amount of stretching of the can body is permitted so that a relatively oversized bottom mounting member may also be used without impairing the efficiency of the structure. The stretching permitted by the creases 24 is important for the additional reason that, when ice cream or the like is frozen in the container, the body is permitted to expand to accommodate the expansion of the frozen material. Splitting of the body incident to the freezing of the ice cream is thereby avoided.

From the above description, it will be understood that each of the elements of our improved container may be made independently of each other and shipped and otherwise handled independently of each other or in groups of parts sufficient for one or any number of cans as may be desired. It will also be understood that the can body will be shipped knocked-down and that it may be readily assembled merely by inserting the bottom structure into the tubular body in the manner explained. Any suitable cover or top indicated at 32 may be provided for the can. However, inasmuch as this forms no part of my present invention, no specific form of top closure need be described.

In Fig. 6, we illustrate a modified form of bottom closure which includes an all metal disc 33 having an upwardly extending peripheral flange 34 and an outwardly projecting rim bead 35. This form of bottom is adapted to be mounted in the can body merely by seating the rim bead 35 on the shoulder 21. In both forms of bottom closure, it will be seen that the bottom may be substantially flush with the end of the can body, whereby the lower edge of the latter is effectively supported against being bent inwardly, for instance, when the can is placed on the floor in a canted position wherein only one side portion of the bottom receives the weight of the can and its contents. Also, in the structure of Fig. 6, instead of forming the two-ply lower marginal portion of the can body by rebending an integral portion (as in Fig. 2), we form such two-ply portion and incidentally provide the shoulder 21 by means of an independent strip or strap 26 of proper width, this strip 26 being preferably in segments to permit collapsing of the can body and being creased at circumferentially spaced points to facilitate bending thereof and secured to the can body by staples in substantially the same manner described above.

The can constructions above described are obviously such that the respective parts may be easily assembled with each other by the user of the can, i. e., by the one who fills the can, at the time the same is to be filled. It is only necessary to distend the preformed, collapsible, tubular body and to insert the bottom closure

in the manner explained. The bottom is positively held against downward displacement by the shoulder 21 and, of course, the can contents, added to the snug fit of the bottom in the body, and the interlock 29—29' when used, serves to prevent upward displacement.

The marginal portion at the lower edge of the tubular body of the can or container could be folded up on the outside of the body and thereby provide a shoulder for supporting the angular bottom retaining rim or ring. In a particular form shown in Fig. 7, a strip 37 of heavy paper stock is stapled or otherwise firmly secured upon the outer surface of the tubular can body with its lower edge flush with the lower edge of the body. To permit collapsing of the tubular body such strip like the marginal portion 20 is sectional. In this form, the angular metal rim or ring 38 fits over the bottom strip 37 and has an inwardly offset rolled edge 39 for engaging the shoulder at the upper edge of the strip 37. In setting up the can or receptacle having a bottom of this form, the metal ring or rim 38 is first applied in position, and it is of such size that the strip 37 on the exterior of the can body can be forced past the inturned rim 39. A rigid bottom 40 which is preferably slightly larger than the internal diameter of the tubular body is forced into the position shown in Fig. 7 and into engagement with the inwardly projecting flange 41 of the metal rim 38. The bottom 40 is heavy and stout and is formed of a number of plies of heavy paper board stapled or otherwise secured together. The engagement of the edge of the bottom 40 with the lower edge of the can body will securely hold the strip 37 in position with its upper edge or shoulder below the inturned or offset rim 38 of the metal ring. In this way, the parts forming the bottom of the can or receptacle are securely held in place and its lower end stoutly reinforced.

We are aware that changes may be made in the above described construction without departing from the spirit of our invention, the scope of which should be determined by reference to the following claims, the same being construed as broadly as possible consistent with the state of the art.

We claim as our invention:

1. In a collapsible container of the class described, the combination of a tubular member formed of a paper blank, said blank having a pair of its opposite edges joined to form said blank into said tubular body and being provided with a plurality of fold lines permitting said body to be collapsed into substantially flat condition, said blank being also provided with a circumferentially extending fold line spaced upwardly from its lower end for facilitating inward and upward folding of the lower marginal portion of said body, said marginal portion being notched out in alignment with said fold lines to facilitate collapsing of said body after said marginal portion is folded, said marginal portion being also provided with a plurality of circumferentially spaced axially extended creases facilitating bending of said upturned marginal portion as an incident to distention of the body, and said upturned portion being secured to said body at a plurality of circumferentially spaced points so as to permit said upturned portion to buckle inwardly intermediate the points of securement as an incident to said distention of the body.

2. In a collapsible container of the class described, the combination of a tubular body member provided with a plurality of fold lines permitting said body to be collapsed into substantially flat condition, said body member being also provided with a circumferentially extending fold line spaced upwardly from its lower end for facilitating inward and upward folding of the lower marginal portion of said body said marginal portion being notched out in alignment with said fold lines to facilitate collapsing of said body after said marginal portion is folded, said marginal portion being also provided with a plurality of circumferentially spaced axially extended creases facilitating bending of said upturned marginal portion as an incident to distention of the body, and said upturned portion being secured to said body at alternately disposed creases so as to permit inward buckling of said upturned portion at alternate creases as an incident to said distention of the body.

3. In a collapsible container of the class described, the combination of a tubular paper body having an internal shoulder spaced upwardly from its lower end, a separate bottom member, and means seated on said internal shoulder for mounting said bottom member within said body and substantially flush with the bottom end of the same, said means comprising a metallic annular member having a side portion fitting snugly within said tubular body at its lower end, a rim portion overhanging said internal shoulder, and a bottom flange extending inwardly substantially in the plane of the bottom end of said body for receiving said bottom member, said bottom member being of sufficient thickness and stiffness to resist buckling and to serve to reinforce the lower end of the body.

4. In a collapsible container of the class described, the combination of a tubular paper body having an internal shoulder spaced upwardly from its lower end, an independent bottom member, and means seated on said internal shoulder for mounting said bottom member within said body and substantially flush with the bottom end of the same, said means comprising a metallic annular member having a side portion fitting snugly within said tubular body at its lower end, a rim portion overhanging said internal shoulder, and a bottom flange extending inwardly for receiving said bottom closure within said body, said side portion being also provided with an inwardly projecting element for retaining said bottom member on said flange.

5. In a collapsible container of the class described, the combination of a tubular paper body having an internal shoulder spaced upwardly from its lower end, an independent bottom member, and means seated on said internal shoulder for mounting said bottom member within said body and substantially flush with the bottom end of the same, said means comprising a metallic annular member having a side portion fitting snugly within said tubular body at its lower end, a rim portion overhanging said internal shoulder, and a bottom flange extending inwardly for receiving said bottom closure within said body, said side portion being also provided with an annular, inwardly projecting shoulder for retaining said bottom on said flange, said bottom being of such size as to be adapted to be forced past said annular shoulder.

6. In a collapsible container of the class described, the combination of a tubular paper body, means in the lower inside end of said body providing an internal shoulder therein spaced upwardly from the lower end thereof, an inde-

pendent bottom member, and means seated on said internal shoulder for mounting said bottom member within said body and substantially flush with the bottom end of the same, said means comprising a metallic annular member having a side portion fitting snugly within said tubular body at its lower end, a rim portion overhanging said internal shoulder, and a bottom flange extending inwardly for receiving said bottom closure within said body, said side portion being also provided with an annular, inwardly projecting shoulder for retaining said bottom on said flange, said bottom being of such size as to require compression when forced past said annular shoulder, and being of such thickness as to fit snugly between said shoulder and said flange.

7. In a collapsible container of the class described, the combination of a tubular paper body, a strip secured to the inside of said body at its lower marginal portion to provide an internal shoulder in said body spaced upwardly from the lower end thereof, said strip being provided with a plurality of circumferentially spaced, axially extending creases facilitating bending of said strip as an incident to distention of the body, said strip being secured to said body at a plurality of circumferentially spaced points whereby the strip is caused to buckle inwardly intermediate the points of securement as an incident to said distention of the body, and a bottom element for the container having a side portion fitting snugly within said strip and an outwardly projecting rim bead at the upper end of said side portion for engaging said internal shoulder to thereby support the bottom element.

8. In a collapsible container of the class described, the combination of a tubular body member formed of a paper blank, said blank having a pair of its opposite edges joined to form said blank into said tubular body and being provided with a plurality of fold lines permitting said body to be collapsed to substantially flat condition, said blank being also provided with a circumferentially extending fold line spaced upwardly from its lower end for facilitating inward and upward folding of the lower marginal portion of said body, said marginal portion being provided with substantially V-shaped notches in alignment with said fold lines, the apexes of said notches being disposed at the outer edge of the marginal portion for the purpose set forth.

9. In a collapsible container of the class described, the combination of a tubular paper body, an inwardly projecting portion in the lower inside end of said body providing an internal shoulder therein spaced upwardly from the lower end thereof, and a bottom for said tubular body having an annular side wall fitting inside of said inwardly projecting portion and an outwardly projecting rim portion at the upper edge of said annular wall adapted to overlie said internal shoulder to support said bottom within said body, said outwardly projecting rim portion being of sufficient size to necessitate expansion of the body to receive the rim, thereby to effect an interlock between said body and bottom.

10. In a collapsible container of the class described, the combination of a tubular body member provided with a plurality of fold lines permitting said body to be collapsed into substantially flat condition, said blank being also provided with a circumferentially extending fold line spaced upwardly from its lower end for facilitating inward and upward folding of the lower marginal portion of said body, said marginal portion being notched out in alignment with said fold lines to facilitate collapsing of said body after said marginal portion is folded, and said upturned portion being secured to said body at a plurality of circumferentially spaced points so as to permit said upturned portion to buckle inwardly intermediate the points of securement as an incident to said distention of the body.

11. A collapsible container comprising a tubular body member formed of stiff paper board material and having at its lower end an inwardly and upwardly turned portion providing an inwardly jutting shoulder above the lower terminus of the body member, said body member having longitudinal fold creases disposed diametrically opposite each other, and said body member and inwardly and upwardly turned portion having longitudinal creases intermediate said first mentioned creases, said creases permitting the collapsing of the tubular body member and its upwardly turned portion, and a circular bottom closure adapted to fit within the tubular body member and seat on said inwardly jutting shoulder and serving when so positioned to hold the lower portion of the body member distended in tubular form.

12. A collapsible container comprising a tubular body member of paper board material and having a strip connected to and positioned within its lower end to form an inwardly jutting annular ledge above the lower terminus of the body member, said body member being provided with fold creases extending longitudinally thereof and disposed diametrically opposite each other, said body member being provided also with intermediate creases extending longitudinally thereof and disposed intermediate said fold creases, said strip being provided with creases corresponding in location and direction with said intermediate creases, said creases permitting the flexing of said body member and strip to collapsed and distended conditions, and a separate circular bottom closure fitting within said body member and seating on said ledge and serving to hold the lower portion of said body member in distended condition.

13. A collapsible container comprising a tubular body member of flexible paper board material having a strip connected to and positioned within its lower end to form an inwardly jutting ledge above the lower terminus of the body member, said body member being flexible to collapsed and distended tubular conditions, and a separate bottom closure having a portion seating on said ledge and a portion fitting within the internal compass of said strip and serving to hold the lower portion of said body member in distended form.

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