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COLLAPSIBLE PAPER CONTAINER

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Fig. 1

Fig. 2

Fig. 3

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This Invention relates to collapsible paper containers of a form adapted to be used for liquids, such as milk, cream and the like. Containers of this type made from paper or cardboard or the like are usually supplied to the merchandising user, as a dairy, in a collapsed form. Such user is usually provided with machines for setting up and treating the containers with a liquid proofing material, such as hot paraffine, which is used to render the containers more liquid tight and more highly non-absorbent. It is desirable that a paper container of this type be constructed so that it is easily and positively rendered liquid proof by the application of a minimum amount of liquid proofing material. To this end the container should not have any cuts extending entirely to the corners, especially below the liquid level, and it should have a top forming portion that seals tightly when closed. Also it is desirable that a container of this type should be strong and substantial and at the same time be economical in construction. It is also very desirable that a container of this type should be provided with spout forming means that is readyed opened in the first instance to form a pouring spout, that is capable of being repeatedly opened and closed, and that substantially seals each time it is closed so as to protect the contents of the container.

The present invention meets all of these requirements by providing a liquid tight paper container with simple and efficient spout means that may be opened and closed repeatedly and that will substantially seal each time it is closed and by providing an inexpensive container that is free from weak points where leakage might occur, that is strong and durable and well reinforced to maintain a proper and attractive shape and that is formed in such a manner as to avoid waste of material.

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It is an object of this invention to provide a paper or cardboard liquid container having an integrally formed pouring spout that may be opened and closed at will and to construct this spout in such a manner that it will always be urged either into a fully open position or a tightly closed position by the resiliency of parts of the container and will always substantially seal when closed to thereby protect the contents of the container and prevent spilling of the liquid if the container is handled after it has been opened.

Another object of this invention is to provide a paper or cardboard liquid container that is folded so as to form both a horizontal and a vertical reinforcing means at two sides thereof, the horizontal reinforcing means helping to keep the two sides of the container flat and tending to prevent them from bulging, thereby imparting to the container a better shape and a more attractive appearance and providing flat sides wherein printed matter and illustrations can be displayed without distortion, and both the horizontal and the vertical reinforcing means helping to strengthen the sides of the container and render it more highly resistant to crushing stresses.

The above mentioned general objects of my invention, together with others inherent in the same, are attained by the device illustrated in the following drawings, the same being a preferred exemplary form of embodiment of my invention, throughout which drawings like reference numerals indicate like parts:

Fig. 1 is a plan view of a paper or cardboard blank employed in the construction of my container showing by broken lines the scoring of the blank to provide for folding;

Fig. 2 shows the blank partly folded in the process of forming the container;

Fig. 3 shows the blank folded and the bottom flaps secured in place to form a completed container ready for the reception of liquid;

Fig. 4 shows the container with the top portion closed as it would appear after being filled, closed and fastened;

Fig. 5 shows the container with the top closed and the pouring spout open for pouring;

Fig. 6 is a plan view looking down on the top of a closed container in which the spout forming portion has been torn along perforated lines so that said spout forming portion may be opened and closed, the spout being shown closed;

Fig. 7 is a fragmentary plan view illustrating the manner of opening and closing of the spout forming portion;
Fig. 8 is a fragmentary plan view showing the spout forming portion open;
Fig. 9 is a vertical medial section through the container taken substantially on broken line 9-9 of Fig. 5 showing one spout forming portion open and the other spout forming portion closed; and Figs. 10 and 11 are fragmentary sectional views taken substantially on broken lines 10-10 and 11-11 of Fig. 6.

The blank from which this container is made is of one piece construction, as shown in Figure 1, and is scored or creased along certain lines to facilitate correct folding of the same. This blank comprises a piece of paper or cardboard of generally rectangular shape scored along four upright lines 12 to mark the four vertical edges or corners of the container and to provide four major sections and a narrow edge tab or sections.

The four main sections comprise four side portions 13, 14, 15 and 16; four bottom forming tabs 17, 18, 19 and 20 connected with the respective side portions 13, 14, 15 and 16, and four top forming tabs or extensions 21, 22, 23 and 24 also connected with the respective side portions 13, 14, 15 and 16. Two score lines 25 and 26 mark the boundaries between the side portions 13, 14, 15 and 16 and the bottom forming tabs and the top forming tabs respectively. These score lines 25 and 26 are at right angles to the lines 12 and mark the edge folds at the bottom and top respectively of the container. Another horizontal score line 27, parallel to lines 25 and 26 is provided near the top edge of the blank. All of the score lines are of the type conventionally provided in paper or cardboard or pasteboard to facilitate folding or bending of the same along predetermined lines.

The bottom forming tab 17, that is connected with portion 13, is longer than the other bottom forming tabs. The bottom forming tabs 18 and 20 are scored along inclined intersecting lines 28 extending between the upper corners of the tabs and points of intersection medially of the tabs and substantially on their lower edges.

The narrow edge tab or sealing flap 30 is connected with one of the edge sections such as section 13-17-21 and extends the full width of such section.

The top forming tab 21 is provided with a fold over extension 30 marked off from the tab 21 by a score line 31. The top forming tab 23 is provided with a fold over extension 32 and 33. The fold over extension 32 is marked off from the top forming tab 23 by score line 34 and lines of perforations 35. The two fold over extensions 32 and 33 are marked off from each other by score line 36. The top forming tabs 21 and 23 are each provided with an inclined score lines 37 extending from the lower corners of said tabs convergently upward and intersecting the score line 27 at spaced apart points. Upright score lines 38 extend from the points where the score line 37 intersects the score line 27 upwardly through the fold over extension 30 of flap 21 and the fold over extensions 32 and 33 of the flap 23.

The tabs 22 and 24 have substantially identical score marks. Each of said tabs has two inclined score lines 40 extending from the lower corners of the tab inwardly and upwardly to a point 41 midway between the two sides of the tab and a short distance above the score line 26. Each tab 22 and 24 also has a score mark 42 extending from the point 41 to the upper edge of the tab and parallel to the score line 26. Each tab 22 and 24 also has score lines 43 and 44 in substantial...
shape shown in Fig. 3, and paraffined or similarly treated to render it liquid tight; it is ready to be filled and closed and sealed. In filling, liquid may be introduced to a level far enough above the score line 25 so that when the container is closed the liquid will substantially fill all the space. The top forming tabs 21—22—23—24 are closed and the portions 46 are bent inwardly along the scored lines 21—22 and 23—24 and outwardly along the scored line 42 and by simultaneously bending the tabs 21 and 23 inwardly along score line 25 until the fold over tabs 30 and 32—33 are brought together at the apex. When this is done the portions 47 of material lying between score line 42 and score line 43—44—45 and also the portions 48 of material lying between score lines 12—44—45 and the corresponding portions lying between score lines 12—31—38 will fold together in accordion fashion. Also a fold in excess of a right angle will be made along score lines 48 and the adjacent score lines 28, as best shown in Fig. 9, and a reinforcement will be provided at this location across the side of the container by the triangular section of material bounded by score lines 48 and 28. This reinforcement will tend to hold the side of the container at 13 and will offer resistance to both bending and crushing. Keeping the sides of the container flat makes them more suitable for the display of reading matter and illustrations and avoids distortion of visual matter displayed on said sides.

After the fold over flaps 30 and 32—33 have been brought together, the flap 33 is folded over the flap 30 along scored line 35 and all three flaps 30—32 and 33 are then folded over along score line 31—34—35 into a position as shown in Figs. 4 to 11. This last folding over of flaps 30—32—33 provides an apex portion that effectively closes the top of the container. This apex portion is preferably secured in the closed position by one or more staples 39 or by an equivalent means. Obviously the folded over top portions have a greater thickness or more plies of material near the ends of the container as shown in Fig. 11, taken on line 11—11 of Fig. 6, than they do intermediate the two end portions, such as on line 10—10 of Fig. 6, which is shown in Fig. 10.

When the fold over tabs are completely folded over one of the perforations 35 will lie along the apex portion of the fold near the respective ends, as shown in Figs. 5 and 6. To open the container one end portion is first torn along the line of these perforations 35. This can be done by inserting the thumb and finger on opposite sides of the folded upright portions 47 and pressing upwardly and outwardly or it can be done by an upward stroke with a sharp instrument. The parts 47 which form the external upright reinforcing fin are grasped with the thumb and finger and pulled outwardly from the position shown in Fig. 6, through the position shown in Fig. 7 to the position shown in Fig. 8 and in Figs. 5 and 9. This allows the liquid to be poured out freely preferably from one of the corners of the spout opening thus formed. The spout opening may be closed by pulling outwardly along the fin members 47 and pushing them inwardly from the position shown in Fig. 8 to the position shown in Fig. 6. This provides for closing the container and protecting the remainder of the contents thereof at the main top forming portions 21 and 23 which will have to be bent along scored lines 37 before the spout can be opened but which are not bent along these scored lines 37 until the spout is opened. When the spout portion is opened the spout forming portions 46 operate like toggle members and bend the inclined top forming sections 21 and 23 along the lines 37—38 in a manner best shown in Fig. 7. When the portions 45 pass a position of alignment with each other in their outward movement, the resiliency of the top forming members 21 and 23 tends to move the spout forming portions 45 into the open position shown in Figs. 5 and 8 and to yieldingly hold the spout open. When the spout is closed, after having been open, the resiliency of portions 21 and 23 will always tend to hold the several parts closed and will thus form a substantial seal to protect the liquid in the container.

While the spout forming parts are shown in duplicate at two sides of the container, it will be understood that they may be provided at one side of the container only.

The fin parts 47 also form an upright reinforcing means that helps to prevent the container from being collapsed by downward pressure such as may occur if a plurality of the filled containers are placed one on top of another and the weight of the containers is crushed down to any substantial extent when the containers are full of liquid, the liquid is liable to be forced out at the top of the containers. The vertical reinforcing provided by the fin members 47 helps to prevent this.

When the top forming end sections 22 and 24 are fully folded into closed position they form gables at two sides of the container, while the sections 21 and 23 form two inclined top portions that converge to the folded over apex portion.

Obviously, changes may be made in the form, dimensions and arrangements of the parts of my invention, without departing from the principle thereof, the above setting forth only preferred forms of embodiment.

I claim:

1. A paper container for liquid comprising a rectangular receptacle; two sloping top members converging to an apex; and two gable shaped end members each folded along M shaped lines and along a medial vertical line that bisects the M shaped folds providing each gable member with two inwardly and upwardly inclined triangular sections and an upright reinforcing medial member.

2. A paper container for liquid comprising a rectangular receptacle having two oppositely disposed sloping top members converging to an apex and folded over at the apex and having perforations parallel to the apex in the folded over portions adjacent the ends of the apex to define lines of tear; and two gable shaped end members each folded along M shaped lines and along a medial vertical line that bisects the M shaped folds providing each gable member with two inwardly and upwardly inclined triangular sections and a medially disposed upright fin member and providing spout means adapted to be opened and closed by pulling outwardly on said fin member after said apex portion has been torn along the perforated lines.

3. A paper container for liquid comprising a rectangular receptacle having two oppositely disposed sloping top members converging to an apex and folded over at the apex and having perforations in the folded over apex portions adjacent the ends of the apex to define lines of tear; and
two gable shaped end members each folded along M shaped lines and folded along a medial vertical line that bisects the M shaped lines of fold and folded along the lines of a flattened isosceles base triangle having its extremities and medial point coinciding respectively with the lower outside extremities and lower medial extremity of the M shaped lines of fold, said folds providing an external upright reinforcing fin and providing spout forming means adapted to be opened and closed by pulling outwardly and pushing inwardly on said reinforcing fin member after the apex portion has been torn along the perforated lines and providing a reinforcing base member disposed transversely of the side of the receptacle at the base of the gable shaped end member and at an incline to the adjacent wall.

4. A paper container for liquid comprising a rectangular receptacle having two oppositely disposed sloping top members converging to an apex; and two gable shaped end members each folded along M shaped lines and folded along a medial vertical line that bisects the M shaped lines of fold and folded along the lines of a flattened isosceles base triangle with its extremities and medial point coinciding respectively with the two outside extremities and the medial extremity at the bottom of the M shaped lines of fold, the flattened base triangle extending in a generally inward direction from the adjacent container wall and providing a reinforcing member disposed transversely of a side of the receptacle at the base of the gable shaped end member to resist crushing stresses and prevent bulging of the adjacent container wall.

5. A paper container for liquid comprising a rectangular receptacle having two oppositely disposed sloping top members converging to an apex and folded over at the apex and having perforations in the folded over apex portions adjacent the ends of the apex to define lines of tear; and two gable shaped end members each folded along M shaped lines and folded along a medial vertical line that bisects the M shaped lines of fold and folded along the lines of a flattened isosceles base triangle having its extremities and medial point coinciding respectively with the outside extremities and medial extremity at the bottom of the M shaped lines of fold, said folds providing an outwardly protruding upright fin member and providing two lateral spout forming members that are movable between a closed spout position in which they are in engagement with the sloping top members of the container and an open spout position in which they are clear of said sloping top members by force applied to said upright fin member after the apex portion has been torn along said perforations, said lateral spout forming members having a toggle like mode of operation whereby they are urged into a fully open or a tightly closed position by the resilient pressure of said inclined side members.

6. A paper container for liquid comprising a rectangular receptacle; two sloping top members converging at an apex; and two gable shaped diametrically oppositely disposed end members each comprising two inwardly and upwardly inclined triangular sections and an intermediate vertical triangular section therebetween extending from the bases of said triangular sections to the apex of said two top members.

7. A paper container for liquid comprising a rectangular receptacle; two sloping top members converging at an apex; and two gable shaped end members each comprising a downward and inwardly inclined horizontal triangular section, two inwardly and upwardly inclined triangular sections and an intermediate vertical section therebetween.

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