June 8, 1943. E. H. GRUGER 2,321,139

COLLAPSIBLE PAPER CONTAINER

Filed Aug. 19, 1940 2 Sheets-Sheet 1

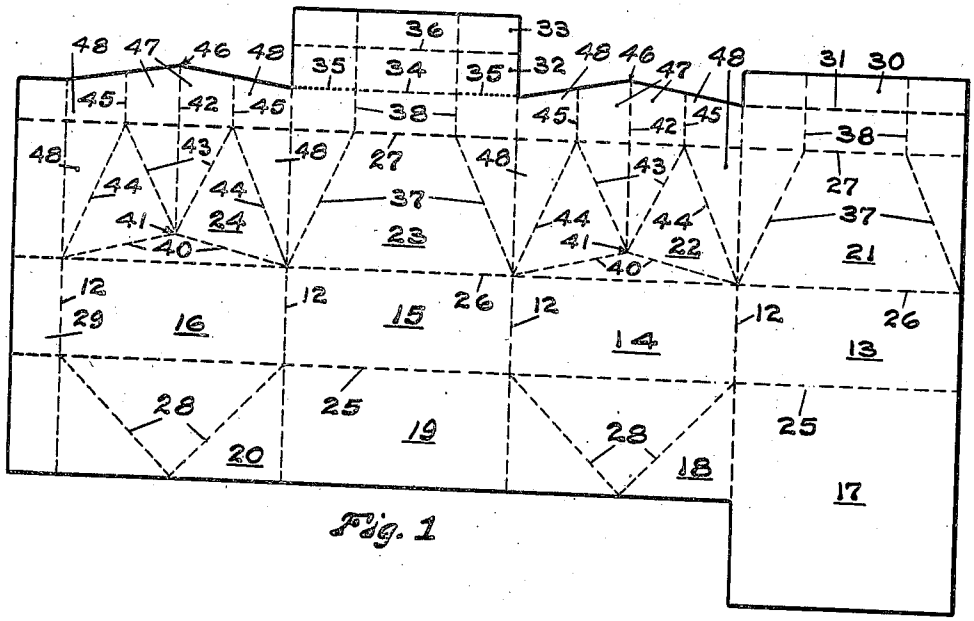


Fig. 1

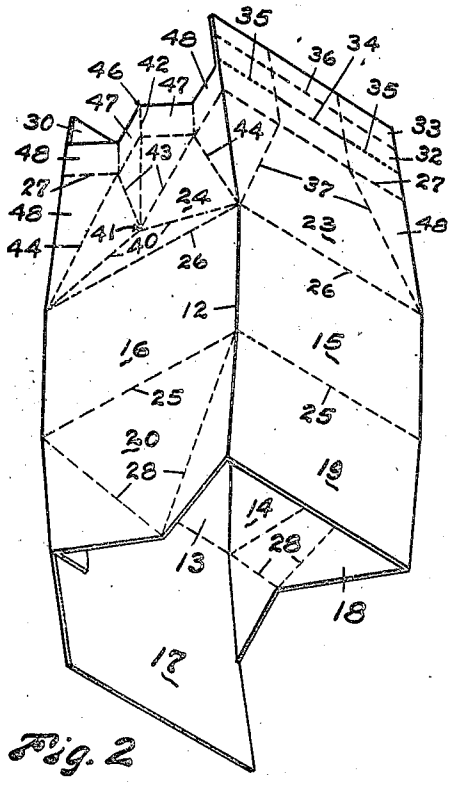


Fig. 2

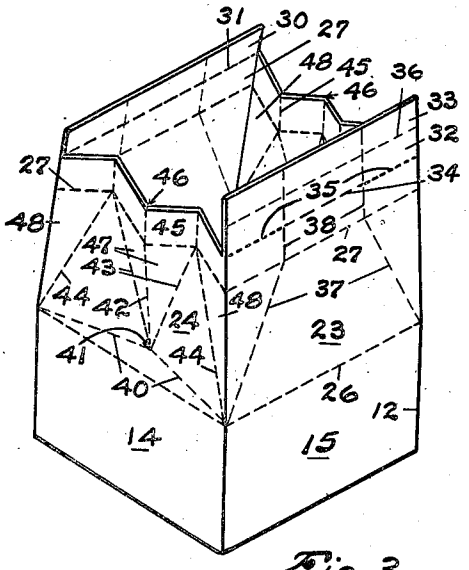


Fig. 3

INVENTOR
Edward H. Gruger
BY
Gbright Arnold
ATTORNEY

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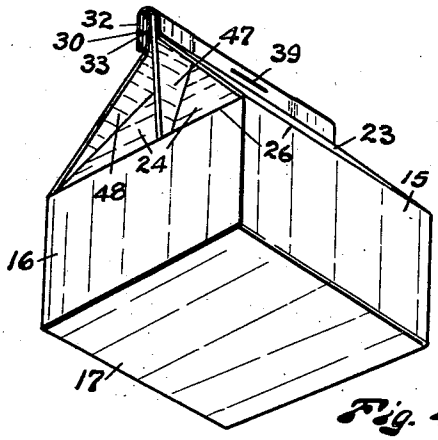


Fig. 4

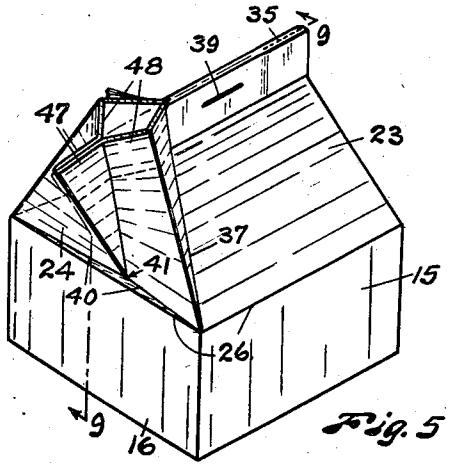


Fig. 5

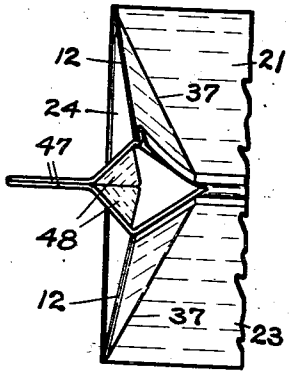


Fig. 8

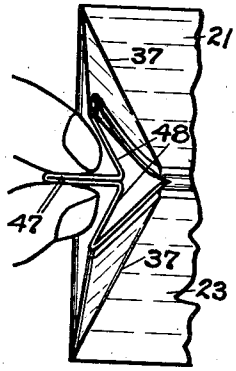


Fig. 7

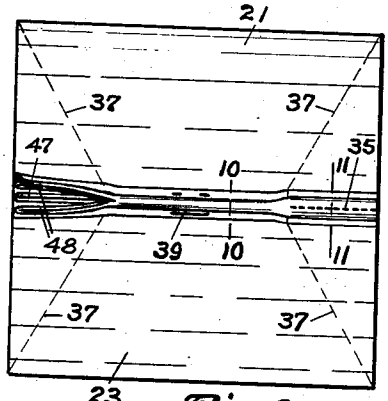


Fig. 6

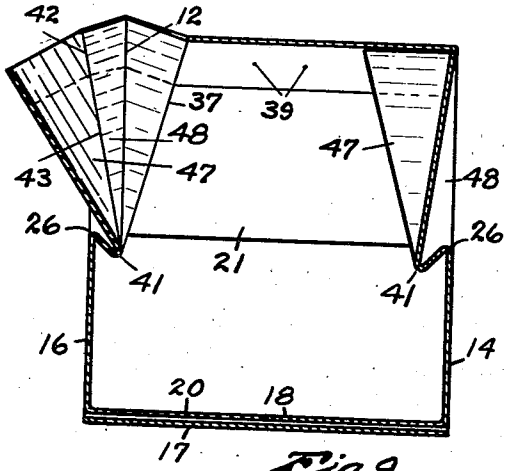


Fig. 9

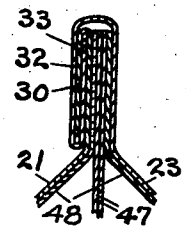


Fig. 11

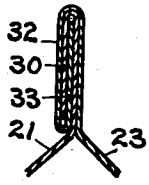


Fig. 10

INVENTOR
Edward H. Gruger
BY
G. Wright Arnold
ATTORNEY

atented June 8, 1943 2,321,139

UNITED STATES PATENT OFFICE

2,321,139

COLLAPSIBLE PAPER CONTAINER

Edward H. Gruger, Seattle, Wash.

Application August 19, 1940, Serial No. 353,159

7 Claims. (Cl. 229—37)

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 seats 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 readily 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.

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.

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.

It is another object of this invention to provide a pare 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 whereon 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.

Another object of this invention is to provide a collapsible paper or cardboard liquid container having a bottom portion that is readily sealed and rendered liquid tight, and that is not liable to leak at the corners.

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:

Figure 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 main sections and a narrow edge tab or section. 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 two fold over extensions 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 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 lines 37 intersect 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 lines 12. Each tab 22 and 24 also has score lines 43 and 44 in substantially the shape of a letter M with the medial base point positioned at point 41, the two side base points positioned at the lower corners of the tab, and the two upper points, where the lines of the M intersect, positioned on the score line 27. Two upright score lines 45 extend from each point where the M shaped score lines intersect the score line 27 to the uppermost edge of the tab.

The score lines 42, 43, 45 form the boundaries of upright sections 47 of material that serve as vertical reinforcing fins and as fingerhold means which may be grasped to open and close the spout. The score lines 12, 44, 45 form the boundaries of spout forming members 48 that cooperate with members 21 in holding the spout either in a fully open or a snugly closed position. The score lines 40—40—26 mark the boundaries of a flattened equilateral triangle that extends inwardly at an incline from the adjacent wall 14 or 15 and provides a reinforcing member when the container is set up.

The upper edge of each tab 22 and 24 is slightly inclined with the medial point 46 projecting the furthest upwardly so that the said upper edge has the shape of a very much flattened gable. When the parts are folded these upwardly protruding upper edges are parallel with the adjoining parts, as shown at the right hand side of Fig. 9.

To form a container out of the blank shown in Figure 1, the said blank is first folded at substantially right angles along lines 12 into substantially rectangular shape. The edge tab or sealing flap 29 is positioned inside of the section 13—17—21 and securely glued or cemented thereto. This leaves the container in substantially the form shown in Fig. 2, except that the end forming tabs will not be bent inwardly along lines 43—44—45 as much as therein shown, but will be more nearly flat. The bottom end forming tabs 18 and 20 are then bent inwardly along the inclined lines 28 and line 25 in a well known manner, and at the same time the tab 19 is folded over the inwardly bent tabs 18 and 20 and the longer tab 17 is folded over the tabs 18, 19 and 20 and all of these parts are securely cemented to provide a container of substantially the shape shown in Fig. 3 with a closed bottom and open top and ready to be paraffined and filled. When the tabs 18 and 20 are folded along inclined lines 28 and line 25 and said two tabs 18 and 20 are simultaneously folded toward each other, the outermost edges of these tabs will be brought into substantially abutting relation along a medial line extending crosswise of the container bottom.

It is to be noted that the blank is not cut at the locations where the bottom corners of the container are formed but that on all sides the bottom forming tabs 17, 18, 19 and 20 are folded inwardly along the scored line 25, thereby forming the corners of the container from uncut integral parts of the material at the locations where the scored line 25 intersects the scored lines 12. This provides a container with strong tight bottom corners which do not require sealing, thus overcoming a weakness common to this type of liquid container made from cardboard.

When the bottom tabs are folded as above described, the edges of the tabs 18 and 20 meet in a straight line across the bottom and the tab 19 and the longer tab 17 overlie them, thereby forming a bottom that is not liable to leak after it has been properly cemented and paraffined.

After the container has been set up in the

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 26 so that when the container is closed the liquid will substantially fill the same. The top forming tabs 21—22—23—24 are closed by bending the tabs 22 and 24 inwardly along the score lines 40—43—44—45 and outwardly along the score line 42 and by simultaneously bending the tabs 21 and 23 inwardly along lines 26 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 lines 42 and score lines 43—45 and also the portions 48 of material lying between score lines 12—44—45 and the corresponding portions lying between score lines 12—37—38 will fold together in accordion fashion. Also a fold in excess of a right angle will be made along score lines 40 and the adjacent score lines 26, 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 40 and 26. This reinforcement will tend to hold the side of the container flat and will offer resistance to both bulging 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 36 and all three flaps 30—32 and 33 are then folded over along lines 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, the lines of perforations 35 will lie along the apex portions 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 grasping 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 after said container has been opened and part of the liquid poured out. After the apex portion of the container is torn along the perforated lines 35 it will be yieldingly held closed by 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 48 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 48 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 48 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 the other. If the top portions of the containers are 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 and pushing inwardly 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.

EDWARD H. GRUGER.