



US 20030136822A1

(19) **United States**

(12) **Patent Application Publication**
Niknamad

(10) **Pub. No.: US 2003/0136822 A1**

(43) **Pub. Date: Jul. 24, 2003**

(54) **DRIPLESS PAPER CUP**

Publication Classification

(76) Inventor: **Nikrooz Niknamad, Berkeley, CA (US)**

(51) **Int. Cl.⁷** **B65D 3/10; B65D 3/28;**
B65D 43/08

(52) **U.S. Cl.** **229/125.16; 229/125.25; 229/198.2;**
229/404

Correspondence Address:

ROBERT S. SMITH
1263 EMORY ST.
SAN JOSE, CA 95126 (US)

(57) **ABSTRACT**

A paper or foam cup having an aperture in the cap positioned to enable a user to drink from the cup through the aperture. Leakage through a gap between cap and cup, normally found in caps of the prior art formed by a step in the rim of the cup at the meeting location of the cup rim and seam of the cup, is prevented by any one of several embodiments of the invention.

(21) Appl. No.: **10/053,979**

(22) Filed: **Jan. 19, 2002**

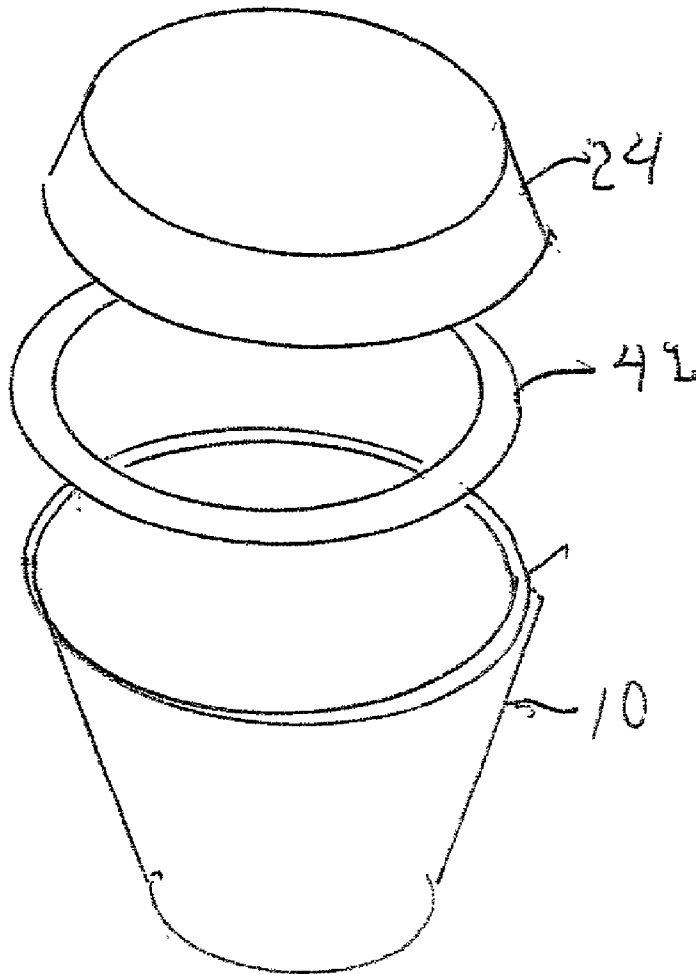


Fig. 1A Prior Art

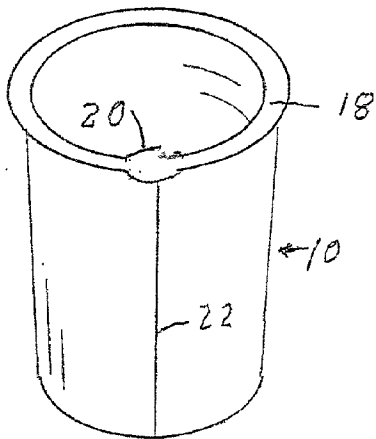
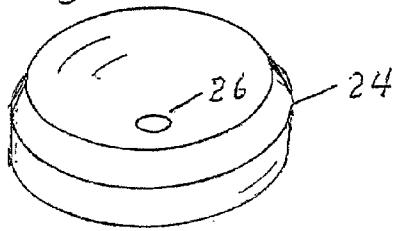


Fig. 1B PRIOR ART

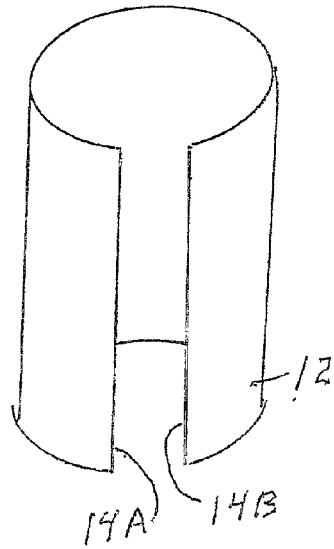
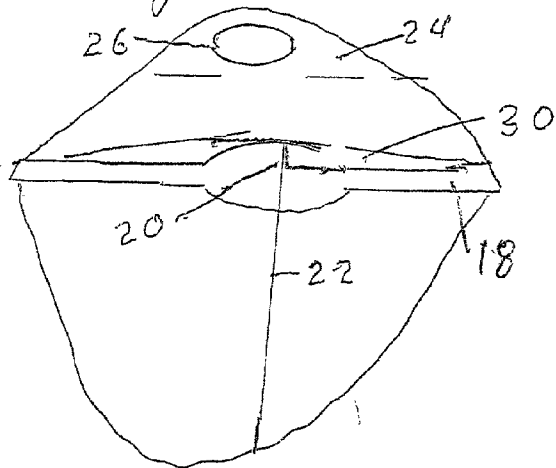
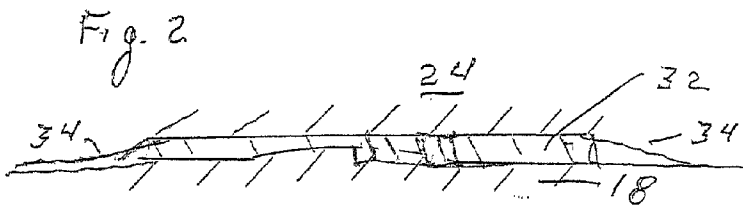
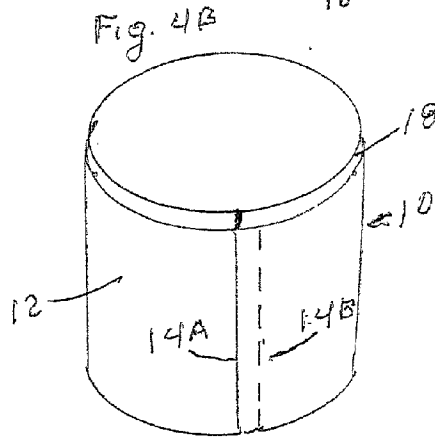
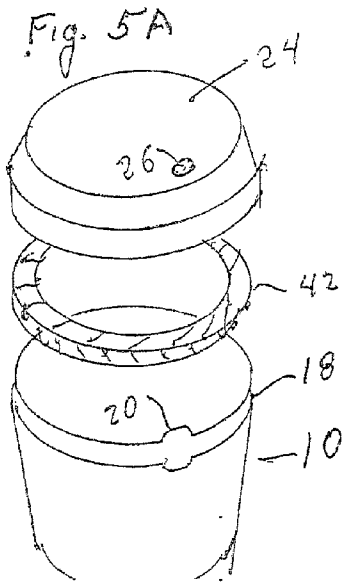
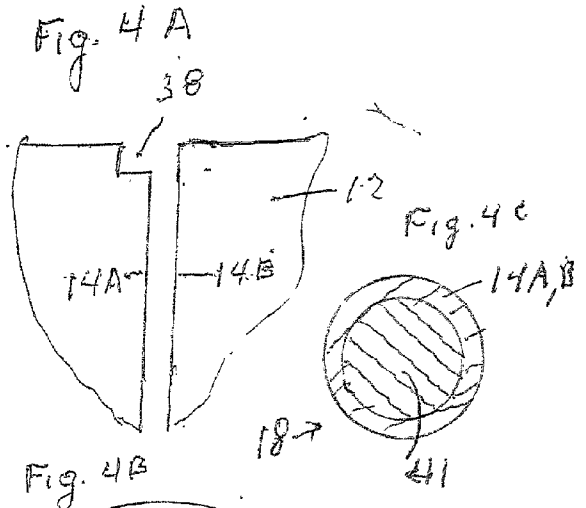
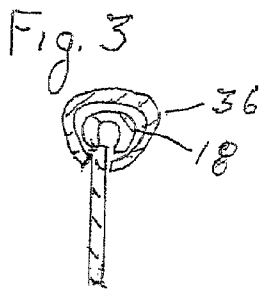


Fig. 1C PRIOR ART





10



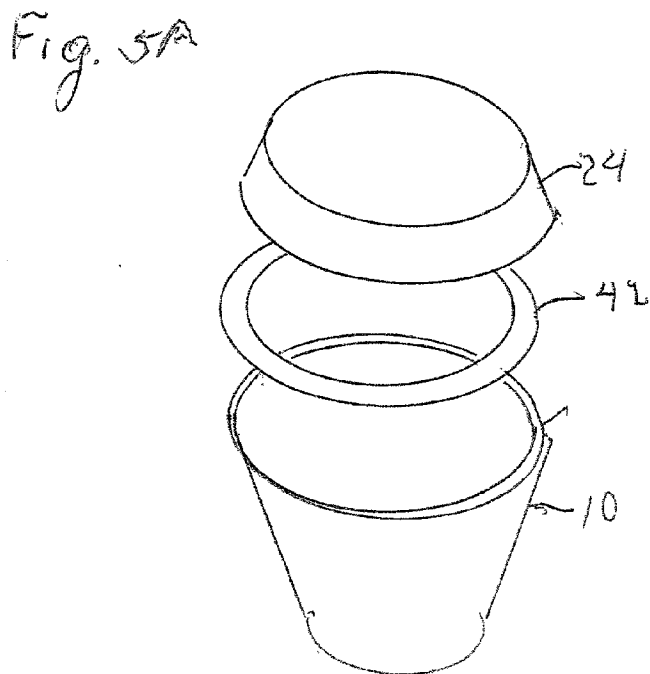
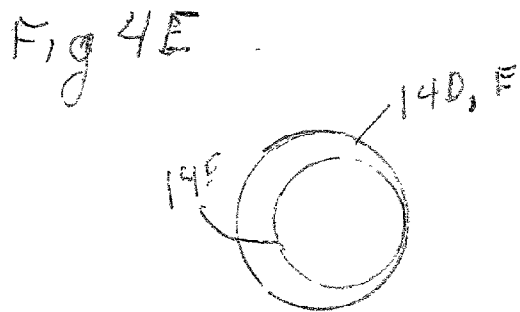
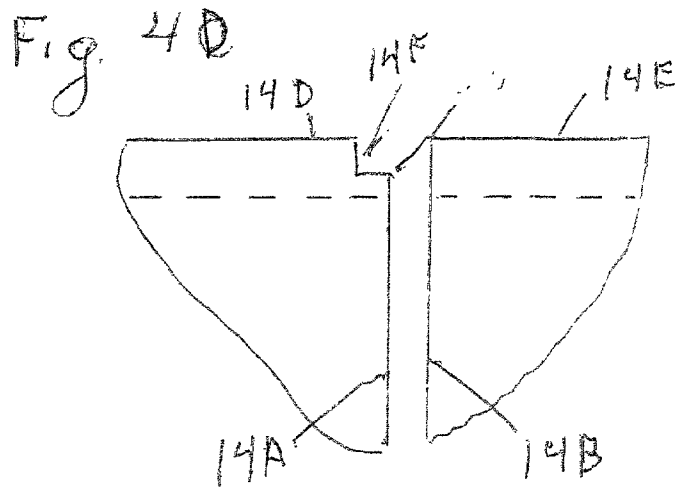


Fig. 5B

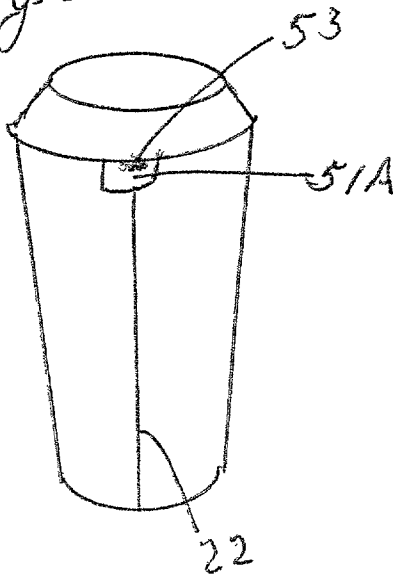


Fig. 5C

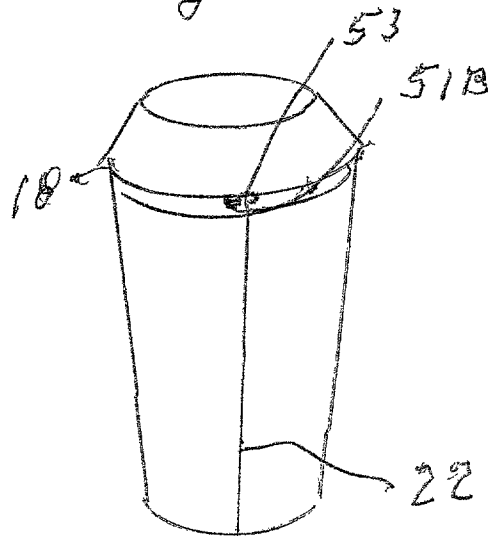


Fig. 5D

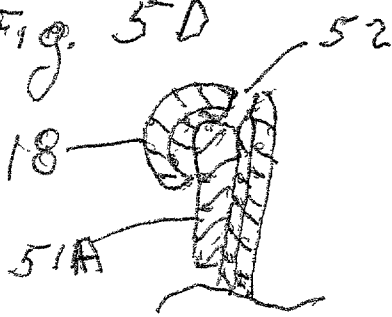
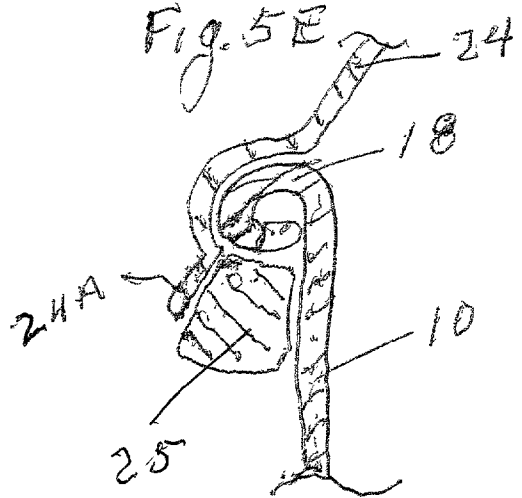
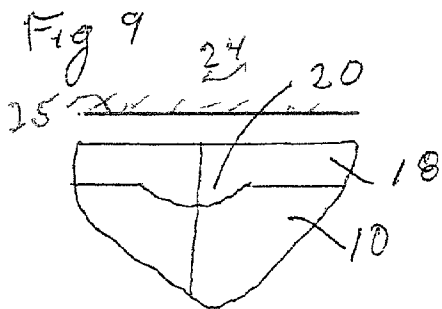
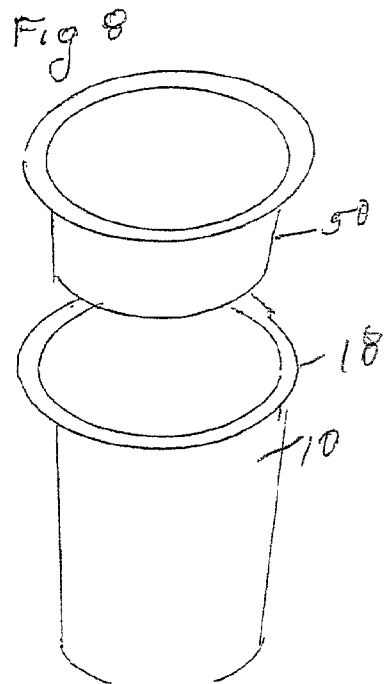
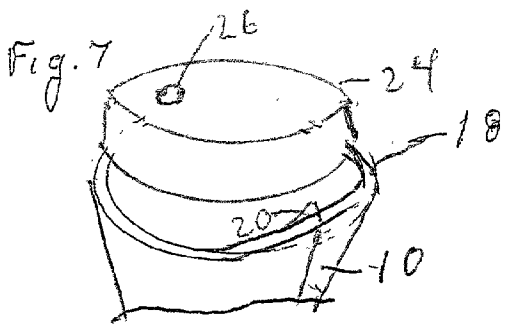
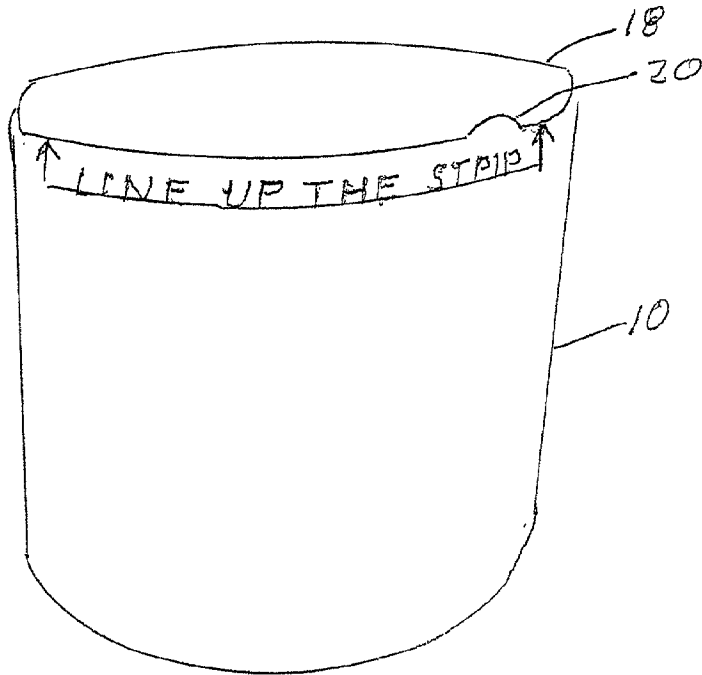
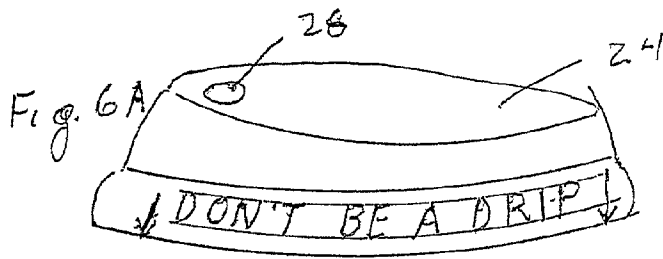
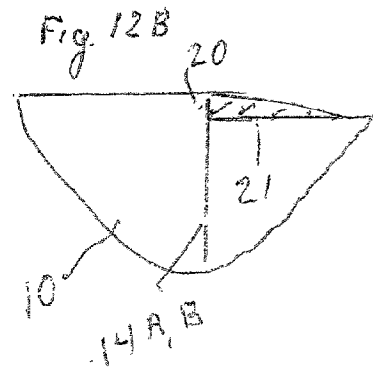
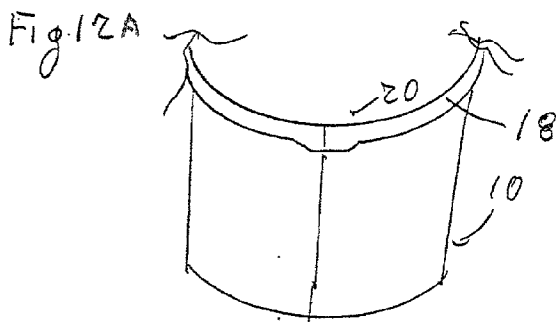
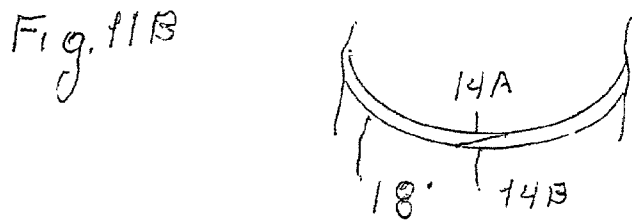
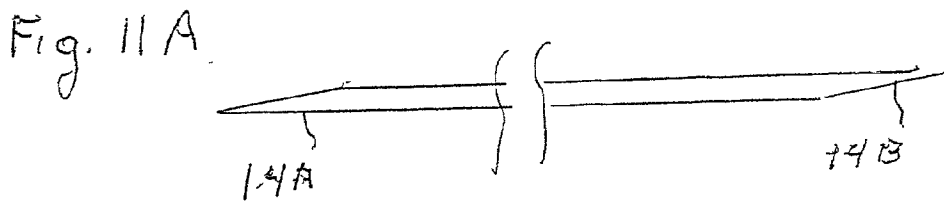
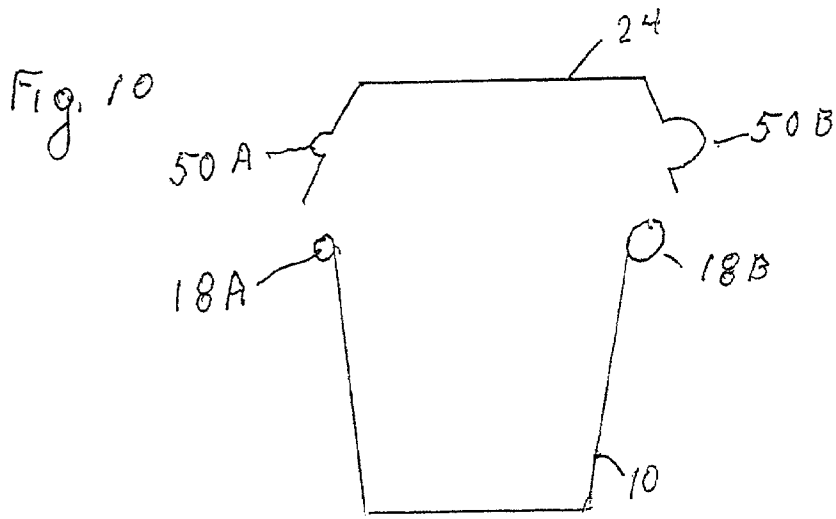
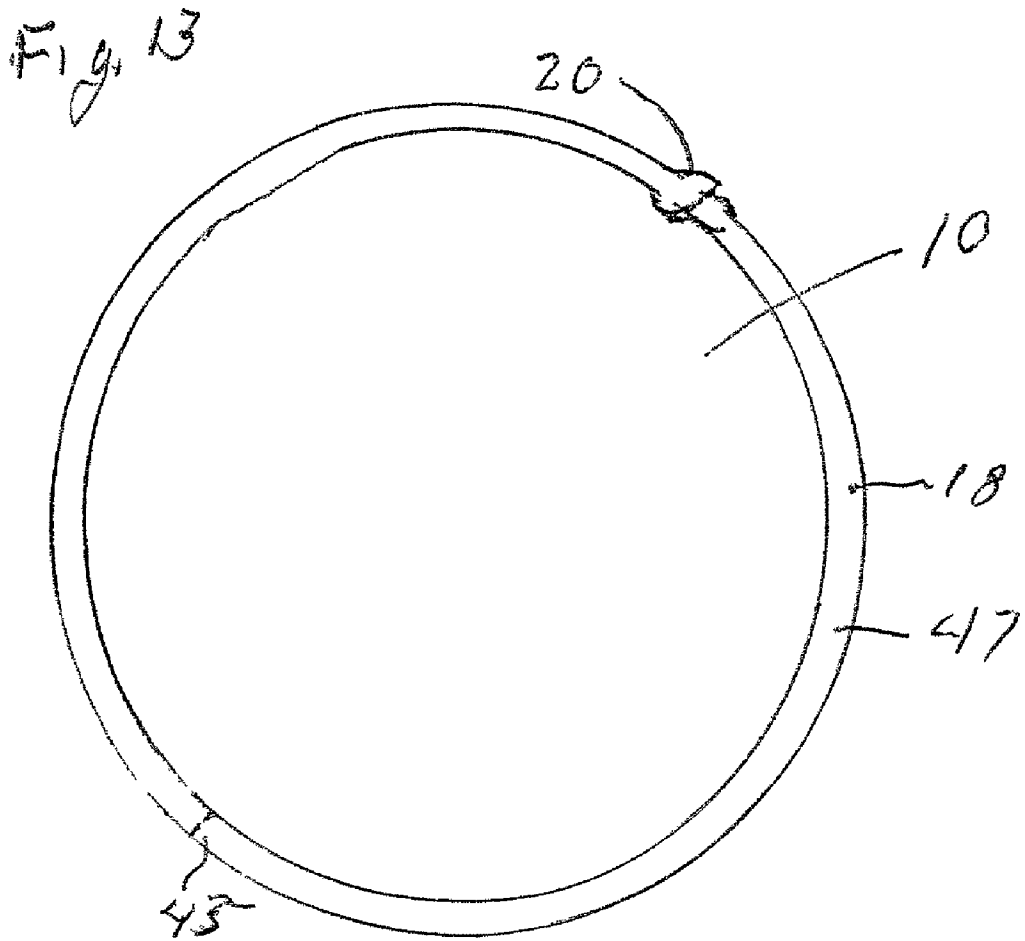


Fig. 5E









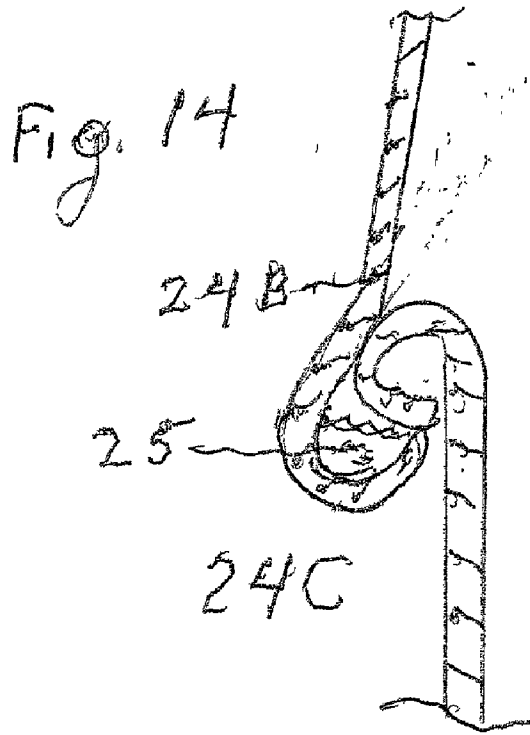
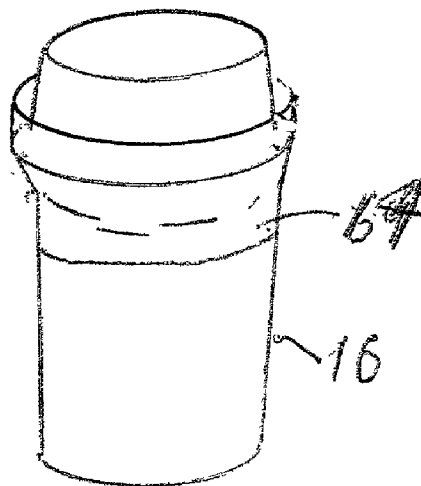


Fig. 15



DRIPLESS PAPER CUP

FIELD OF THE INVENTION

[0001] This invention relates to a cup made of any one of paper, foam, plastic foam and particularly to a paper cup that does avoid dripping liquid contents of the cup from leaking from the cup onto the user.

BACKGROUND AND INFORMATION DISCLOSURE

[0002] Paper cups are used to hold beverages—coffee, soft drinks, etc. to be ultimately drunk by a user. The cup is typically a paper sheet bent into a cylinder to where two opposite edges of the sheet are glued together. The overlap union of the edges forms a seam that extends from the lip to the bottom of the cup. The lip of the cup is then rolled to form a rim around the lip of the cup that reinforces the rim. It is characteristic of this construction of the cup that the overlap of edges forming a seam inadvertently forms a lump or step in the ring at the end of the seam.

[0003] Such cups, dispensed from fast food stores and coffee shops, are often provided with a plastic cap that snaps around and onto the rim at the lip of the cup to prevent spillage particularly when the cup is being transported, e.g., in an automobile. In some versions, the cap has a “drinking” hole near the edge of the cap (the hole being about ¼ inch diameter) whereby the user is able to drink the contents through the “drinking” hole with reduced incidence of spillage when he is otherwise engaged such as riding in an automobile.

[0004] However, the cup with cap is not a perfect solution to the problem. The presence of the lump or step in the rim at the seam results in a small opening of gap between lip and cap. When the cap is placed onto the cup at an orientation of the cap where the drinking hole is close to the seam, liquid leaks out unbeknown to the user when he drinks through the hole in the cap and the leakage drips onto the users clothing, etc., especially if the liquid is hot

SUMMARY OF THE INVENTION

[0005] It is an object of this invention to provide a cup with cap that avoids the problem of leakage associated with the opening between lip and cap due to the presence of the lump or step in the rim of the cup formed by the seam.

[0006] This invention is directed toward construction of a cup that has no sharp lump or step in the rim forming the lip in the cup that would otherwise result in an opening between the lip and a cap snapped onto the lip.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIGS. 1A, B and C show a cup of the prior art.

[0008] FIG. 2 is a sectional cutaway view of a cup with feathered edge.

[0009] FIG. 3 shows a cup with a second ring.

[0010] FIGS. 4A, B, C, D, E show the cup with cutouts in the sheet positioned to reduce/eliminate the step or lump.

[0011] FIG. 5A shows a cup with compliant gasket.

[0012] FIG. 5B shows a piece of sponge adjacent the gap.

[0013] FIG. 5C shows a sponge ring around the cup near the rim.

[0014] FIG. 5D is a sectional view showing the sponge under the rim of the cup with a hole in the rim.

[0015] FIG. 5E is a sectional view showing the sponge under the skirt of the cap.

[0016] FIGS. 6A, B show a cup with markings to orient the cap diametrically opposite the seam in the cup.

[0017] FIG. 7 shows the cup and cap with an egg shape.

[0018] FIG. 8 shows the cup with a secondary sleeve that engages the overlying surface of the cap.

[0019] FIG. 9 shows the cup with a flattened rim that engages the flat mounting surface of the cup thereby avoiding the formation of an aperture.

[0020] FIG. 10 shows the reverse curve for snapping cup onto the rim in only one orientation.

[0021] FIGS. 11A, B show feathered edges of the paper for forming the cup.

[0022] FIGS. 12A, B show the lump or step reduced by suitable means such as abrasion, pounding the lump or step, or applying filler to the step.

[0023] FIG. 13 shows the rim of the cap with a thread for engaging the threaded rim of the cup with a block in each thread positioned to align the drinking aperture in the cap positioned diametrically opposite the step in the cup when the cap is screwed onto the cup.

[0024] FIG. 14 shows an embodiment in which the rim of the cap has a convoluted extension.

[0025] FIG. 15 shows an embodiment in which a band around the cup is flared.

DESCRIPTION OF BEST MODES FOR CARRYING OUT THE INVENTION.

[0026] Turning now to a discussion of the drawings, FIG. 1A shows a cup 10 of the prior art. FIG. 1B shows a sheet 12 (e.g., paper, plastic foam)) for forming the cup of FIG. 1A. The sheet 12 is bent to form a truncated cone (tapered cylinder) by joining the two opposite edges 14A, B of the sheet 12. One edge 14A overlaps the other edge 14B and the edges are secured together by glue to form a seam 22. A bottom edge of the truncated cone is joined to a paper disk (not shown) forming the bottom of the cup. The top edge of the truncated cone is rolled to form a firm lip 18. A step or sharp lump 20 is inadvertently formed in the lip 18 because of the double layer of paper forming the seam 22 in the cup 10

[0027] A cap 24 is poised for snapping onto the lip 18 of the cup 10. The cap 24 has a hole 26 near the edge of the cup enabling a user to drink the contents of the cup 10 through the hole 26.

[0028] However, as shown in the cutaway view, FIG. 1C, when the cap 24 is snapped onto the lip 18 of the cup 10, the step or lump 20 causes a gap 30 to occur between the meeting surfaces of the cap 24 and the lip 18. When the cap 24 is snapped onto the lip 18 such that the gap 30 is close

to the hole 26 (rather than distal from the hole 26) in the cap 24, then leakage occurs through the gap 30 when the user drinks through the hole 26.

[0029] There are several embodiments of this invention that provide a cup in which leakage of the liquid through a gap between cap and lip is avoided.

[0030] FIG. 2 is a sectional view showing one embodiment, in which a paper or polyethylene strip 32 straddles and is secured to the lip 18 of the cup 10. The strip is secured by glue, caulk or non-toxic sealant or any safe material to seal the gap and selected to withstand the heat of a hot drink. The edges 34 of the strip 32 extend beyond both ends of the lump or step 20. The edges 34 of the strip 32 are "feathered" or has a trapezoidal shape so that there is no abrupt step in the rim forming the lip 18 and the cap 24 has sufficient compliance so that the cap 24 forms a tight seal along the entire length of the strip 32. The strip 32 may have a trapezoidal shape providing that, when the strip is wrapped around the rim, any lump has a gradual slope on each end that mitigates against formation of an abrupt step that results in a gap between cap and cup when the cap is mounted on the cup.

[0031] FIG. 3 is a sectional view showing another embodiment in which a secondary ring 36 (preferably injected molded or elastomeric material so that it has no seam) is securely sealed onto the lip 18 thereby forming a secondary lip that has no lump or step.

[0032] A cap 24 snapped onto this secondary lip would not engage any lump that would otherwise create a gap.

[0033] FIGS. 4A, B show another embodiment in which a shoulder 38 is cut in a corner of the sheet 12. The edges 14A and 14B are joined forming the cup 10. FIG. 4C is a sectional view showing the lip 18 of the cup 10 wrapped around a short rod 41 of plastic, sponge, paper or other material, not shown thereby avoiding overlap to form a lump at the end of the seam in cup 10. The seam and joint is sealed with a non-toxic caulk, glue or sealant when necessary to avoid gap formation.

[0034] FIG. 4D shows an alternative arrangement in which one edge 14D has a cut 53 arranged to permit rolling the edge 14D into a smaller diameter than rolled edge 14E. As shown in FIG. 4E., when edge 14E is rolled over rolled edge 14D, the step is minimized or eliminated.

[0035] FIG. 5A is an exploded view of another version in which a compliant gasket 42 is securely mounted on the inner rim of the cap 24 where the cup and cap meet each other. The gasket 42 is made of elastomeric material so that it conforms to the lip 18 providing that openings between lip and cap occurring without the gasket are avoided.

[0036] In one embodiment, the gasket comprises a compliant sponge.

[0037] FIGS. 5B, B show another embodiment in which a sponge 51 is mounted on the cup close to the lip 18 so that any leakage through the aperture will be retained by the sponge 51. In one version (FIG. 5B) the sponge 51A is a short section glued to the cup 10. In another version, (FIG. 5C) the sponge 51B is a ring (or band) that encircles the cup close to the lip 18.

[0038] FIG. 5D is a sectional cutaway view showing another embodiment including a small hole 52. The hole 52

is located in the seam 22 through the lip 18 and communicates with the suitable absorbing material such as sponge, paper, cloth, etc. Beverage will leak out through the hole 52 and be absorbed by the sponge 51A "stealing" any beverage that would otherwise leak at the step 20. It will be understood that "sponge" is an appropriate absorbing material.

[0039] FIG. 5E shows the sponge (suitable absorbing material such as sponge, paper, cloth, etc) under lip 18 of cup 10 between the side of the cup 10 and skirt 24 of cap 24. Cup 10 and cap 24 are shown cutaway in FIG. 3E,

[0040] In another embodiment, colored markings and indicia on the cup and cap warn the user not to position the hole in the cap adjacent the seam in the lip. A number of versions of warning are contemplated. FIG. 6A shows one version being a simple statement on the cap, "DON'T BE A DRIP" and statement on the cup, "LINE UP THE STRIP" with alignment marks 31 on both cap and cup. The habitual coffee-drinking user will soon learn to follow the direction and orient the cap on the cup such as to avoid aligning the lump 20 with the hole 26 in the cup 10.

[0041] FIG. 6B shows another version in which an outline of a hand 11 is imprinted on the cup 10 opposite the seam so that when the cup is tilted as the user drinks. The beverage flows away from the seam.

[0042] FIG. 7 is a top view of another version of the cup in which the rim 18 of the cup 10 is not a circle but rather is egg shaped. The cap 24 is also egg shaped so that the cap will snap onto the rim 18 of the cup 10 in only one orientation. In this orientation, the hole 26 is diametrically oppositely positioned distal from the lump 20 so that the user can drink from the hole in the cap without leakage through the opening formed by the lump 20.

[0043] FIG. 8 shows another version in which a sleeve 50 is poised for inserting into the cup 10. The cap (not shown) fits snugly into the sleeve thereby avoiding leakage through any gap that is otherwise formed by the seam in the rim of the cup.

[0044] FIG. 9 shows the lump 20 has been flattened out. The surface 25 of the cap 24 engaging the rim 18 is also flat so that a gap at location 30 does not form at the interface of the cap and rim of the cup.

[0045] FIG. 10 is a sectional view showing the lip of the cap 24 having a reverse curve 50A poised to interface with the rim 18A of the cup 10. The reverse curve 50A provides that the cap will "snap" down over lip 18 of the cup 10 so that the cap 24 is secured to the cup. It is an embodiment of this invention that the thickness of the rim 18 at location 18B of the cup is greater than the thickness of the lip 18A on the diametrically opposite side. The reverse curve 50B of the cap 24 is accordingly greater on one edge of the cap than reverse curve 18A at the opposite location. This provides that the cap 24 will sit with only one orientation on the cup 10 with the hole on the cap diametrically opposite the seam in the cup.

[0046] The radii of the convex surface mating with the concave surface are selected to apply sufficient force between the surfaces to level (fill) the triangular opening caused by the step.

[0047] FIG. 11A, shows an edge of the paper forming the cup before (FIG. 11A) and after (FIG. 11B) the seam 14 is

formed. The edges **14A** and **14B** are feathered so that the thickness of the lip **18** is uniform at the seam as shown in **FIG. 11B**. Therefore, when the edge of **FIG. 11B** is rolled, no step or sharp lump will be formed.

[**0048**] There have been described several versions of an invention to avoid spillage that otherwise occurs due to the formation of a gap between the lip of a cup and a cap snapped onto the lip of the cup due to the presence of the step at the rim of the paper cup. An object of the invention is to remove the step or lump occurring at the seam of the cup or to promote mounting the cap onto the cup oriented to where the hole in the cup is not adjacent to the lump on the rim. Variations of the invention may be contemplated after reading the specification and studying the drawings, which are within the scope of the invention.

[**0049**] For example, **FIG. 12A** shows that the step or sharp lump **20** has been removed by any one of:

[**0050**] abrading the lip or cutting the step or lump away with a suitable tool

[**0051**] pounding or forcing the upper level of the step down to where the upper level is planar with the lower level of the step;

[**0052**] pounding or forcing the lower level of the step up to where the upper level is planar with the lower level of the step.

[**0053**] sealing, filling and feathering the triangular opening caused by the step **20** with the a suitable waterproofing material such as paper, caulk, glue, elastomeric material as shown in **FIG. 12B**.

[**0054**] **FIG. 13** illustrates another version for preventing alignment of the step (or lump) formed at the seam in the rim of the cup and the drinking aperture in the cap near the rim of the cap. In this version, the rim **19** of the cap **24** has a thread **45** that engages a thread **47** on the rim **18** of the cup **10** by twisting the cap onto the rim in a manner well known in the art. The thread **45** in the cap **24** and the thread **47** in the cup **10** each have a block **43** so that when the cap **24** is screwed onto the cup **10**, the cap will screw onto the cup only until the two blocks, **45** and **43**, meet. The cap and cup are constructed so that the two blocks meet when the aperture in the cap is located at a position that is remote (preferably diametrically opposed) to the position of the step in the cup.

[**0055**] **FIG. 14** is a sectional view showing another embodiment in which the rim **24B** of the cap **24** has a convoluted extension **24C** which captures leakage **25** that would otherwise spill onto the user

[**0056**] **FIG. 15** is a perspective view showing a band **64** around the cup **10** with an edge **66** adjacent the rim of the cup **10** flared away from the cup **10** to absorb or redirect leaking beverage away from the drinker.

[**0057**] In view of these variations, I therefore wish to define my invention by the appended claims.

I claim:

1. A beverage dispenser for enabling a user to drink from said dispenser which comprises:

a cup, being a sheet of paper having a thickness', and being substantially rectangular, and having a first pair of opposing edges and a second pair of opposing edges;

said sheet rolled to where one edge of said first pair of edges overlaps and adheres to another edge of said first pair of edges; whereby a truncated cone being side of a cup is formed having a seam of double said thickness formed by said overlapping first pair of edges;

a bottom panel adhered to one edge of said second pair of edges whereby a bottom of said cone is formed enabling said cup to hold said beverage;

another edge of said second pair of edges operably rolled to form a rim extending around said cone along said another edge of said second pair of edges whereby said cup, being a truncated cone with a closed bottom and open top with a rim, is formed;

a cap having a drinking aperture and arranged to snap onto said rim enabling a user to drink beverage from said cone through said aperture from said cup;

means for preventing spillage from said beverage dispenser resulting from one of:

(i) formation of a gap between said cap and said rim at a location where said rim meets said seam, said gap, without said means, resulting from a step in said rim formed by said double thickness of said seam in combination with a single thickness of said sheet remote from said location;

said gap resulting in leakage of beverage through said gap when said aperture in said cap is proximal to said gap when said user attempts to drink from said cup through said aperture.

(ii) said aperture in said cap, without said means for preventing, being proximal to a gap between said cap and said rim at a location where said rim meets said seam, said gap resulting from a step in said rim formed by said double thickness of said seam in combination with a single thickness of said sheet remote from said location.

2. The beverage dispenser of claim 1 wherein said spillage results from formation of said gap between said cap and said rim at a location where said rim meets said seam.;

said gap resulting in leakage of beverage through said gap when said aperture in said cap is proximal to said gap when said user attempts to drink from said cup through said aperture.

3. The beverage dispenser of claim 1 wherein said means for preventing formation comprises:

a strip of one of paper and polyethylene straddling and adhered along said rim including said location;

said strip secured by a non-toxic sealant;

said strip having feathered edges extending on both sides of said seam;

said cap having sufficient compliance to enable said cap to form a seal along an entire length of said strip.

4. The beverage dispenser of claim 3 wherein said strip has a trapezoidal shape operably arranged to provide that the thickness of the rim at the seam has a slope away from both sides of the seam.

5. The beverage dispenser of claim 2 wherein a second rim (36) is secured over said rim

6. The beverage container of claim 2 wherein said means for preventing formation comprises a shoulder formed in a corner of said sheet where said one edge of said first pair of edges meets said another edge of said second pair of edges providing that said entire rim comprises a single layer of rolled paper.

7. The beverage container of claim 2 wherein said means for preventing comprises said first pair of edges being feathered and joined to one another in an operable arrangement whereby thickness of said seam is substantially the same as the thickness of said sheet.

8. The beverage container of claim 7 comprising a rod inside said rim at said seam whereby said rim is strengthened.

9. The beverage container of claim 2 wherein said means for preventing spillage comprises a compliant gasket securely mounted on said cap arranged to form a seal with said rim when said cap is mounted on said rim.

10. The beverage container of claim 2 wherein said means for preventing leakage comprises said step being shaved at said step to where said step is converted to a sufficiently gradual slope to prevent formation of said gap.

11. The beverage container of claim 1 wherein said spillage results from said aperture in said cap being proximal to a gap between said cap and said rim at a location where said rim meets said seam, said gap resulting from a step in said rim formed by said double thickness of said seam in combination with a single thickness of said sheet remote from said location and said means for preventing spillage comprises:

means for avoiding placement of said cap on said cup with said aperture proximal to said seam.

12. The beverage container of claim 11 wherein said means for preventing spillage comprises:

said cap having a cap rim with a circumferential channel operably arranged to mate with said rim of said cup;

said channel having a channel width that varies from a maximum value at one cap rim location to a minimum value at a diametrically opposite cap rim location;

said cup rim having a width that varies from a maximum value at one cup rim location to a minimum value at a diametrically opposite cup rim location providing that said cup will mate with said cap only when said cap is oriented with respect to said cup in a position where said aperture is distal from said seam.

13. The beverage container of claim 11 wherein said means for avoiding comprises:

markings adjacent said cup rim and markings adjacent said cap rim and instructions on at least one of said cap rim and said cup rim directing a user to align said markings adjacent said cup rim with markings adjacent said cap rim arranged to provide that said aperture is distal from said seam.

14. The beverage container of claim 11 wherein said means for avoiding comprises:

said rim of said cup and a rim of said cap each configured with a thread dimensioned to permit screwing said cap onto said rim;

each said thread having a block operably arranged to provide that when said cap I screwed completely onto said rim, said block in said rim abuts said block in said cap where said aperture is distal from said gap.

15 A beverage dispenser for enabling a user to drink from said dispenser which comprises:

a cup, being a flexible sheet of one of paper and plastic having a thickness', and being substantially rectangular, and having a first pair of opposing edges and a second pair of opposing edges;

said sheet rolled to where one edge of said first pair of edges overlaps and adheres to another edge of said first pair of edges; whereby a truncated cone being side of a cup is formed having a seam of double said thickness formed by said overlapping first pair of edges;

a bottom panel adhered to one edge of said second pair of edges whereby a bottom of said cone is formed enabling said cup to hold said beverage;

another edge of said second pair of edges operably rolled to form a rim extending around said cone along said another edge of said second pair of edges whereby said cup, being a truncated cone with a closed bottom and open top with a rim, is formed;

a cap having a drinking aperture and arranged to snap onto said rim enabling a user to drink beverage from said cone through said aperture from said cup;

means for preventing spillage from said beverage dispenser resulting from one of:

(i) formation of a gap between said cap and said rim at a location where said rim meets said seam, said gap, without said means, resulting from a step in said rim formed by said double thickness of said seam in combination with a single thickness of said sheet remote from said location;

said gap resulting in leakage of beverage through said gap when said aperture in said cap is proximal to said gap when said user attempts to drink from said cup through said aperture.

(ii) said aperture in said cap, without said means for preventing, being proximal to a gap between said cap and said rim at a location where said rim meets said seam, said gap resulting from a step in said rim formed by said double thickness of said seam in combination with a single thickness of said sheet remote from said location.

16. The beverage container of claim 9 wherein said compliant gasket comprises a sponge.

17. The dispenser of claim 15 further comprising:

a sponge, being one of a ring secured around a circumference of said cup adjacent said rim and a sponge piece secured to an outside surface of said cup in an area of said surface including said seam and adjacent said lip.

18. The dispenser of claim 15 further comprising:

a sponge, being one of a ring secured around a circumference of said cap inside said cap adjacent said a rim of said cap and a sponge piece secured to an inside surface of said cap in an area adjacent said rim of said cap operably arranged to prevent leakage of beverage through said gap.

19. The dispenser of claim 18 further comprising a hole in a surface of said cup positioned between said sponge and said lip arranged to provide that beverage that, when a user drinks from said cup with said cap mounted on said cup, beverage will be short circuited into said sponge through said hole and avoids flowing through said gap.

20. The dispenser of claim 17 wherein said sponge is material selected from a group of materials that consists of paper, cloth, synthetic material

21. The dispenser of claim 18 wherein said sponge is material selected from a group of materials that consists of paper, cloth, synthetic material.

22. The dispenser of claim 15 further comprising: said cap having a rim with a convoluted extension operably arranged to capture leakage of beverage that would otherwise spill onto the user.

23. The dispenser of claim 15 further comprising a band around said cup with an edge adjacent to the rim of the cup flared away from the cup to absorb or redirect leaking beverage away from the drinker.

24. A method for preventing leakage onto a drinker of a beverage from a cup having a seam on a side of said cup forming a step in a lip of said cup and a cap that snaps onto said said rim, said cap having an aperture adjacent said lip for drinking said beverage, said leakage resulting when said gap is adjacent said gap, said method including the step of instructing the drinker to avoid mounting the cap onto the cup with the cap oriented to where the aperture is adjacent said gap.

* * * * *