A tamper resistant closure for a cup-like container having a rim which surrounds the open end of the container, the rim having a rib on its inner side with which a peripheral flange of the container can cooperated to inhibit removal of the closure from the container. The closure includes a dispensing spout through which the contents of the container can be consumed, the spout having a series of spaced slots. In another form, the closure is in the form of a stopper having a similar dispensing spout, the stopper being adapted to be located within the neck of a bottle-like container.
TAMPER RESISTANT CLOSURES

BACKGROUND OF THE INVENTION

[0001] 1. Technical Field
[0002] This invention relates to tamper resistant closures and in particular to closures for use with drinking vessels such as cup-like containers and bottles or other necked containers to prevent tampering with the contents thereof. In one aspect, the closure is in the form of a cap for a cup-like container. In another aspect, the closure is in the form of a stopper for use with bottles or other necked containers. The present invention in a further aspect aims to provide a container such as a cup-like container and bottle-like containers provided with tamper resistant closures of the above type.

[0003] 2. Background Art
[0004] An increasing problem which is encountered in nightclubs or other establishments or even in private events where drinks are served in cups, bottles or other containers is that of drink tampering also commonly known as drink spiking. Thus where a person leaves a drink unattended for a short period of time, a substantial risk arises that a contaminant can be placed into the drink unknown to the person.
[0005] This is a particular risk to females where drugs commonly known as "date-rape" drugs can be introduced into a drink container such as a cup or drink bottle with the aim of rendering the female drinking from the cup or bottle incapacitated and therefore making them susceptible to assault or sexual attack. Of course this problem can also arise in relation to males who after drinking a contaminated drink may be rendered susceptible to assault and possible robbery.

SUMMARY OF THE INVENTION

[0006] The present invention aims in one aspect to provide a closure for use with a cup or other similar drinking vessel which prevents or substantially reduces the risks of tampering with the container or the contents thereof. The present invention aims in another aspect to provide a closure for a necked container such as a bottle which prevents or substantially reduces the risks of tampering with the container or the contents thereof. In another aspect, the present invention aims to provide containers provided with closures of the above type. Other objects and advantages of the invention will become apparent from the following description.
[0007] The present invention thus provides in one aspect a closure for a liquid container having an open upper end through which liquid in said container can be consumed, said closure being adapted to prevent unauthorized tampering with the contents of said container and having:
[0008] a main body, said main body having an upper side and a lower side and a peripheral engagement portion adapted to be engaged with said container whereby said closure substantially closes the upper end of said container and removal of said closure from said open upper end is inhibited; and
[0009] a dispensing spout on said upper side of said main body enabling dispensing of the contents of said container.
[0010] The container in embodiment comprises a drinking vessel in the form of the cup and the main body of the closure which is in the form of a lid suitably has a peripherally extending return flange adapted to cooperate with the cup adjacent the open end thereof to prevent or inhibit detachment of the closure from the cup. The cup may be provided with an inwardly directed annular rib surrounding its open upper end and the return flange is suitably adapted to locate within the open upper end of the cup and below the rib to cooperate therewith to inhibit detachment of the closure from the cup. The return flange is suitably adapted to be resiliently deflected to pass the annular rib to allow the closure to be applied to and be retained to the cup.
[0011] Preferably the closure main body includes a downwardly extending peripherally extending skirt and the return flange extends upwardly from a lower end of the skirt.
[0012] Preferably the inwardly directed rib of the cup is provided on its top side with an inclined lead in surface which facilitates inward resilient deflection of the return flange as the closure is applied to the cup.
[0013] The dispensing spout suitably comprises a hollow cap-shaped body. A plurality of dispensing ports or slots may be arranged circumferentially of the spout body and define fluid outlets.
[0014] The body of the dispensing spout further suitably comprises an outer annular rim or ridge which surrounds the dispensing ports or slots. The rim or ridge defines a moat around the ports or slots.
[0015] Suitable the main body comprises a top wall having a recess therein to accommodate the nose of the person drinking from the container.
[0016] The present invention in another aspect provides in combination, a cup having an open upper end and an inwardly directed annular rib surrounding said upper end and a closure as described above, the peripheral engagement portion of the closure being adapted to cooperate with the rib to inhibit removal of the closure from the container.
[0017] In another embodiment, the container has a neck terminating in an outlet defining the open upper end of the container, and the closure is a stopper-like closure adapted to be located with the neck with the peripheral portion of the main body frictionally engaged therewith to hold the closure therein.
[0018] Suitable the peripheral portion comprises an annular maximum diameter edge portion of the main body. The main body may have a frustoconical leading portion tapering from the annular edge portion towards a leading end of the main body, that is the end inserted into the neck, to facilitate placement of the closure into the neck of the container. The main body may also have a frustoconical trailing portion extending rearwardly from the annular edge portion to said dispensing spout.
[0019] The dispensing spout as above suitably comprises a hollow cap-shaped body extending from the main body of the closure. The body of the dispensing spout is suitably stepped inwardly from the main body of the closure. A plurality of dispensing ports or slots are suitably arranged circumferentially around the body of the dispensing spout. Preferably the dispensing spout includes a substantially planar top wall. Preferably the dispensing openings intersect the top wall and define in the top wall a substantially planar top surface. The dispensing openings may be of a slot-like configuration.
[0020] The body of the dispensing spout is adapted to define with the necked portion of the container, an annular channel forming a moat surrounding the dispensing ports or slots.
[0021] The present invention in another aspect provides in combination, a container having a neck and a stopper-like closure as described above, said closure being located within the neck with the peripheral engagement portion of the closure being frictionally engaged with, the inner surface of the neck.
Preferably the closure is located substantially wholly within the neck. Preferably the closure is located substantially flush with the open end of the neck of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:

FIG. 1 is a perspective view of a closure according to a first embodiment of the present invention;
FIG. 2 is a side view of the closure of FIG. 1;
FIG. 3 is a perspective view of a closure according to the present invention; applied to a cup-like container;
FIG. 4 is a top view of the closure and container;
FIG. 5 is a sectional view of the container and closure along line A-A of FIG. 4;
FIGS. 6 and 7 are enlarged views of the regions B and C respectively of FIG. 5;
FIGS. 8 and 9 are opposite perspective views of a bottle closure according to an embodiment of the invention;
FIGS. 10 and 11 are side and top views of the closure of FIG. 8; and
FIG. 12 illustrates the manner in which the bottle closure of FIGS. 8 to 11 is used in combination with a bottle.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings and firstly to FIGS. 1 and 2 there is illustrated a lid-like closure 10 for a cup or other similar drinking vessel according to an embodiment of the present invention. The closure 10 is of a generally disc-shaped configuration and includes a main top panel or body 11, an integral slightly outwardly inclined side skirt 12 extending around the periphery of the top panel 11 and an integral annular return flange 13 extending upwardly and outwardly from the lower free edge of the skirt 12. The top panel 11 of the closure 10 additionally includes an integrally formed upwardly extending drinking spout 14 shown also in FIG. 6 which is of a generally cylindrical configuration and of cup-like or inverted cup-shaped form and which has an outer slightly frustoconical outer wall 15 which terminates in an upper annular rim or ridge 16. A cylindrical raised land 17 is located within and is coaxial with the rim or ridge 16. A series of circumferentially spaced outlet ports or slots 15 are provided around the land 17, the ports or slots 15 extending through the side of the land 17 and further through the top surface of the land 17. A moat 19 is defined between the rim or ridge 16 and the land 17 which surrounds the ports or slots 15. A concave recess 20 is formed in the top panel 11 extending in a generically radial direction from the inner radial side of the drinking spout 14.

The closure 10 is formed of a thin stiff but resilient plastics material such as polypropylene typically by injection molding. The return flange 13 is thus capable of resilient deflection for a purpose which will be described further below.

The closure 10 is adapted to be used with a cup-like container 21 as shown in FIG. 3 which includes a main frustoconical body 22 having at its upper end an outwardly stepped shoulder 23 leading into an annular flange like rim 24 which surrounds and defines the upper open end 25 of the container 21. The rim 24 as more clearly shown in FIG. 6 and 7 is provided at its upper free edge with an inwardly directed annular rib 26 which extends around the inner side of the rim 24. The rib 26 includes an upper inwardly and downwardly inclined surface 27 and a lower outwardly and downwardly inclined surface 28 on opposite sides of a central minimum diameter portion 29 of the rib 26. The return flange 13 has a maximum diameter slightly greater than the minimum diameter of the rib portion 29.

The container 21 is typically formed of a plastics material and molded in an injection molding process.

The container 21 is used as is conventional for a containing a liquid to be consumed which is defines into the body 22 of the container 21 in a normal manner through the open upper end 25 and prior to application of the closure 10 to the container 21. To prevent or reduce tampering with the container 10 or the liquid contents thereof, the closure 10 is then applied to the container 21 by centralizing the closure 10 related to the open upper end 25 and then forcing the closure 10 onto the container 21. During this procedure, the return flange 13 will initially contact the upper inclined surface 27 of the annular rib 26 such that as the closure 10 is forced downwardly onto the container 10, the cooperation between the inclined surface 27 and the flange 13 will cause the flange 13 to be resiliently deflected inwardly until it reaches the minimum inner diameter of the rib 26 defined by the rib portion 29. Further downward force applied to the closure 10 will permit the flange 13 to resiliently move outwardly being guided by the lower inclined surface 28 so that it “snaps” into position beneath the rib 26. It will be seen that in this position, the upper end 30 of the flange 13 is located beneath the rib 26 and the diameter of closure 10 at the upper end 30 of the flange 13 is greater than the minimum diameter of the rib 26 at the central portion 29. Thus if an attempt is made to remove the closure 10, the upper end 30 of the flange 13 will abut the rib 29 which acts as a stop to prevent detachment of the closure 10 from the container 21. Thus the risk that the closure 10 can be removed from the container 21 is very low and therefore the risks of “spiking” the drink within the container 21 by removal of the closure 10 and placing contaminants within the container 21 is eliminated or substantially reduced.

The contents of the container 21 however can be drunk by using the dispensing spout 14 applied to the mouth with the liquid being dispensed through the series of ports 18. As the container 21 is tipped during drinking from the dispensing spout 14, the recess 20 in the closure 10 will accommodate the nose of the person drinking from the container 21 so that the contents thereof can be fully dispensed from the container 21. The series of small ports 18 also substantially reduce the risks that any contaminants can be introduced into the container body 22 through the ports 18. In addition, as the rim or ridge 16 surrounding the ports 18 defines a moat 19, if any attempt is made to introduce a contaminant liquid through the ports 18, the contaminant liquid will be apparent in the moat 19 which acts as a “tell tale” making the person drinking from the container 21 aware of the attempted tampering.

To facilitate drinking of liquid from the container 20, the closure 10 may be provided with one or more air vents 31 (see FIG. 7) which are defined as slots or notches in the outer surface of the return flange 13 and which define a passage for air into the container 21 to replace the liquid being drunk from the container. The vents 30 however are concealed and therefore are not an apparent means for introducing con-
taminants into the container 21. It will be appreciated that the ports 18 may be of various configurations other than the slot configuration illustrated. Furthermore, the dispensing spout 14 may be provided with any number of ports 18 as required to enable easy dispensing of liquid from the container 21. In a simplified version, the rim or ridge 16 of the dispensing spout 14 may be eliminated. The closure 10 may also include is required one or more apertures spaced from the spout 14 which allow for air to pass into the container body 22 as liquids are being consumed.

[0040] Referring now to FIGS. 8 to 11, there is illustrated a tamper resistant stopper-like closure 32 according to another embodiment of the present invention which is adapted primarily for use with a necked container such as a bottle but which has features similar to features of the closure 10. The closure 32 comprises a stopper having a main hollow body 33 and an upper dispensing spout 34 which extends from the top side of the main body 33 but is stepped inwardly therefrom through the shoulder 35. The main hollow body 33 includes an outer wall 36 which comprises an upper frustoconical portion 37 which is inclined outwardly and downwardly from the shoulder 33 to a maximum diameter annular edge region 38 and a lower frustoconical lead-in portion 39 which is inclined inwardly and downwardly from the maximum diameter edge region 38. The maximum diameter edge region 38 is of a diameter substantially the same as or slightly greater than the internal diameter of the neck of a container or bottle with which the closure 32 is to be used.

[0041] The dispensing spout 34 is of cup-shaped or inverted cup-like form and has a generally cylindrical side wall 40 extending upwardly from the shoulder 35 and spaced inwardly from the outer wall 36 of the main body 33, and a substantially planar top wall 41. A series of circumferentially spaced ports 42 which are of slot-like configuration are provided around the periphery of the upper end of the spout 34 and extend along and through the side wall 40 of the spout and up through the top wall 41 in a similar manner, to the ports 18 of the embodiment of FIGS. 1 to 7. The ports 42 extend through the top wall 41 in a generally radial direction inwardly from the side wall 40. A central, planar top region of the top wall 41 however remains uninterrupted by the ports 42.

[0042] In use and as shown in FIG. 12, the closure 32 is inserted into the neck 43 of a bottle or the like with the frustoconical lead-in portion 39 of the closure 32 facilitating the insertion of the closure 32 into the upper end of the neck 43. The neck 33 has an internal diameter “D” which is substantially the same as or slightly less than the external diameter of the edge region 38. Thus the maximum diameter edge region 38 of the closure 32 will frictionally engage the inner surface of the neck 43 so as to be substantially sealed thereto. The contact between the closure 32 and inner surface of the neck 43 however is only an edge contact which is sufficient to substantially seal the closure 32 to the neck 43 but which allows for some movement of the closure 32 longitudinally of the neck 43. The closure 32 is forced into the neck 43 such that the top wall 41 of the closure spout 34 is substantially flush with the upper end of the bottle neck 43 as shown.

[0043] Liquid thus may be drunk or dispensed from the bottle in a normal manner by lifting the bottle with liquid in the bottle being dispensed through the respective ports 42. As however the closure 32 substantially blocks the neck 43 of the bottle, the chances of a contaminant such as a capsule or tablet being introduced into the bottle is substantially reduced. In addition, the small dispensing ports 42 while being sufficient to allow liquids to be drunk from the bottle or dispensed, substantially reduce the risks of any other contaminants such as a powder or liquid being introduced into the bottle. The relatively large planar surface of the top wall 41 of the spout 34 will also provide an indication that an attempt has been made to tamper with the contents of the bottle as materials such as powders which are attempted to be introduced into the bottle will be apparent on the wall 41. As the spout 34 has an outer wall 40 which is inwardly stepped, and therefore less than the diameter “D” of the inner surface of the neck 43, an annular channel 44 will be defined between the spout 34 and neck 43. This channel 44 forms a “moat” surrounding the ports 42 (similar to the moat 19 of the embodiment of FIGS. 1 to 7) and thus if any attempt is made to introduce a contaminant liquid through the ports 42, the contaminant liquid will be apparent in the moat or channel 44 which acts as a “tell tale”.

[0044] In addition, as the closure 32 is located fully within the bottle neck 43, it is almost impossible to remove from the neck 43 without the use of a tool. Any attempt to remove the closure 32 will most likely cause the closure 32 to be moved further into the neck 43 and/or drop into the bottle and therefore be apparent to the user.

[0045] It will be appreciated that the ports 42 may be of various configurations other than the slot configuration illustrated. Furthermore, the dispensing spout 34 may be provided with any number of ports 42 as required to enable easy dispensing of liquid from the container or bottle.

[0046] While the closure 32 is primarily designed for use with bottles it may be used with other liquid containers with the main body 33 of the closure 32 being designed to frictionally engage with the inner wall of the container adjacent its mouth or opening.

[0047] The closure 32 is preferably formed of plastics by injection molding with the parts thereof formed integrally.

[0048] The terms “comprising” or “comprises” or derivatives thereof as used throughout the specification are taken to specify the presence of the stated features, integers and components referred to but not preclude the presence or addition of one or more other feature/s, integer/s, component/s or group thereof.

[0049] While the above has been given by way of illustrative embodiment of the invention, all such variations and modifications thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein defined in the appended claims.

What is claimed is:

1. A closure for a liquid container having an open upper end through which liquid in said container can be consumed, said closure being adapted to prevent unauthorized tampering with the contents of said container and having:
   a main body, said main body having an upper side and a lower side and a peripheral engagement portion adapted to be engaged with said container whereby said closure substantially closes the upper end of said container and removal of said closure from said open upper end is inhibited; and
   a dispensing spout on said upper side of said main body enabling dispensing of the contents of said container.

2. A closure as claimed in claim 1 wherein said container comprises a cup and wherein said main body of said closure has a peripherally extending return flange adapted to cooper-
ate with said cup adjacent the open end thereof to prevent or inhibit detachment of the closure from the cup.

3. A closure as claimed in claim 2 wherein said cup is provided with an inwardly directed annular rib surrounding said open upper end and wherein said return flange is adapted to locate within said open upper end of said cup and below said rib to cooperate therewith to inhibit detachment of said closure.

4. A closure as claimed in claim 3 wherein said return flange is adapted to be resiliently deflected to pass said annular rib to allow the closure to be applied to and be retained to said cup.

5. A closure as claimed in claim 4 wherein said main body includes a downwardly extending peripherally extending skirt and wherein said return flange extends upwardly from a lower end of said skirt.

6. A closure as claimed in claim 4 wherein said inwardly directed rib of said cup is provided on its top side with an inclined lead in surface which facilitates inward resilient deflection of the return flange as said closure is applied to said cup.

7. A closure as claimed in claim 1 wherein said dispensing spout comprises a hollow cap-shaped body.

8. A closure as claimed in claim 1 and including a plurality of dispensing ports or slots arranged circumferentially on said spout body and defining fluid outlets.

9. A closure as claimed in claim 8 wherein said body of said dispensing spout further comprises an outer annular rim or ridge which surrounds said dispensing ports or slots, said rim or ridge defining a moat around said ports or slots.

10. A closure as claimed in claim 1 wherein said main body comprises a top wall having a recess therein to accommodate the nose of the person drinking from said container.

11. In combination, a cup having an open upper end and an inwardly directed annular rib surrounding said upper end and a closure as claimed in claim 1, said peripheral engagement portion of said closure being adapted to cooperate with said rib to inhibit removal of said closure from said container.

12. A closure as claimed in claim 1 wherein said container has a neck terminating in an outlet defining said open upper end of said container, said closure being adapted to be located with said neck with said peripheral portion of said main body frictionally engaged therewith to hold said closure therein.

13. A closure as claimed in claim 12 wherein said peripheral portion comprises an annular maximum diameter edge portion of said main body.

14. A closure as claimed in claim 13 wherein said main body has a frustoconical leading portion tapering from said annular edge portion towards a leading end of said main body to facilitate placement of said closure into said neck of said container.

15. A closure as claimed in claim 14 wherein said main body has a frustoconical trailing portion extending rearwardly from said annular edge portion to said dispensing spout.

16. A closure as claimed in claim 15 wherein said dispensing spout comprises a hollow cap-shaped body extending from said main body of said closure.

17. A closure as claimed in claim 16 wherein said body of said dispensing spout is stepped inwardly from said main body of said closure.

18. A closure as claimed in claim 17 and including a plurality of dispensing ports or slots arranged circumferentially around said body of said dispensing spout.

19. A closure as claimed in claim 18 wherein said body of said dispensing spout is adapted to define with said necked portion of said container, an annular channel forming a moat surrounding said dispensing ports or slots.

20. In combination, a container having a neck and a closure as claimed in claim 12, said closure being located within said neck with said peripheral engagement portion of said closure being frictionally engaged with the inner surface of said neck.

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