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(54) **CLOSURES**

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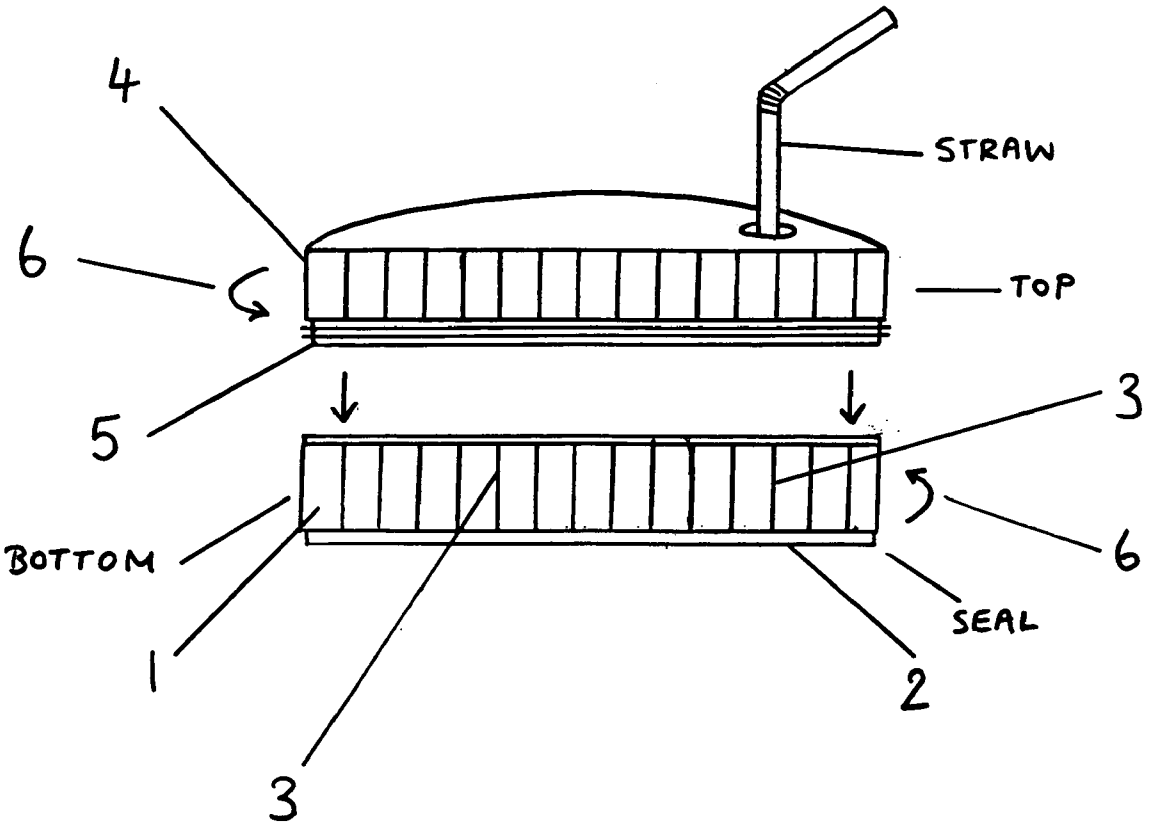
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(57) **ABSTRACT**

A removable closure is provided which is particularly useful for closing drinking vessels containing liquid to prevent spillage if the vessel is knocked over. The closure comprises two sections a first section (**1**) for placement around the top of the drinking vessel. The second section (**4**) being attachable to the first section (**1**) in a manner that brings the first section into contact with the exterior of the vessel (**7**) to provide a liquid tight seal. In a preferred embodiment the second section (**4**) may be provided with a sealable aperture through which a drinking straw can be inserted whilst retaining the liquid seal around the drinking straw.



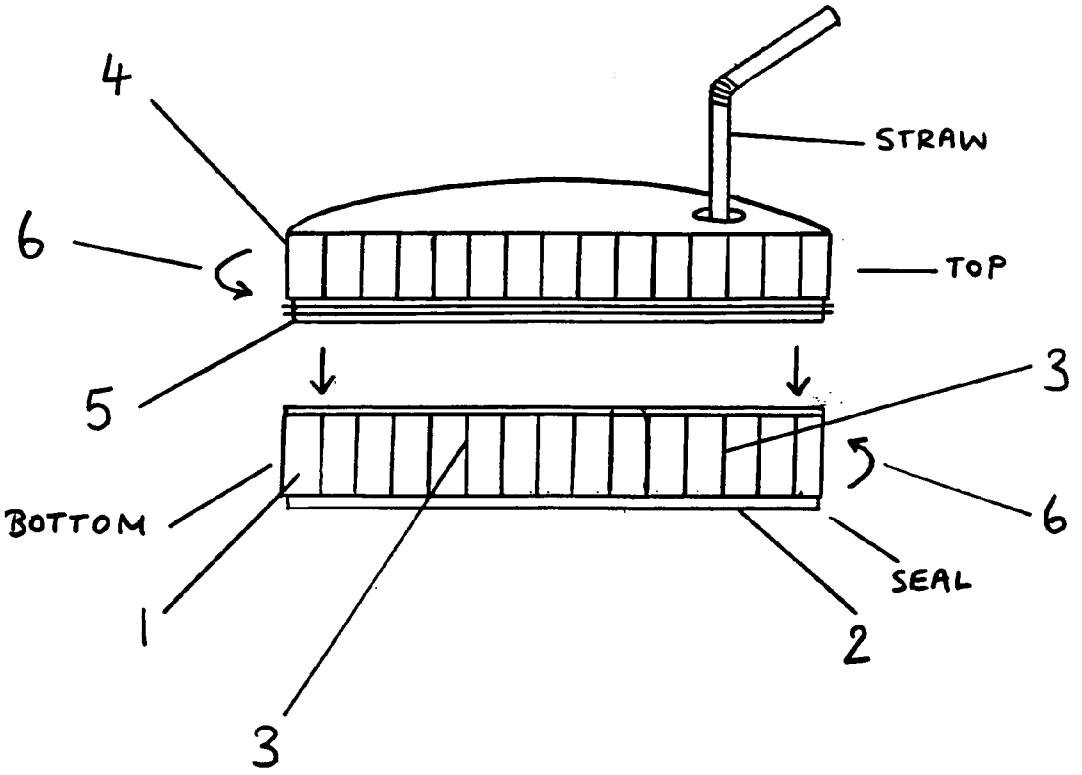


FIGURE 1

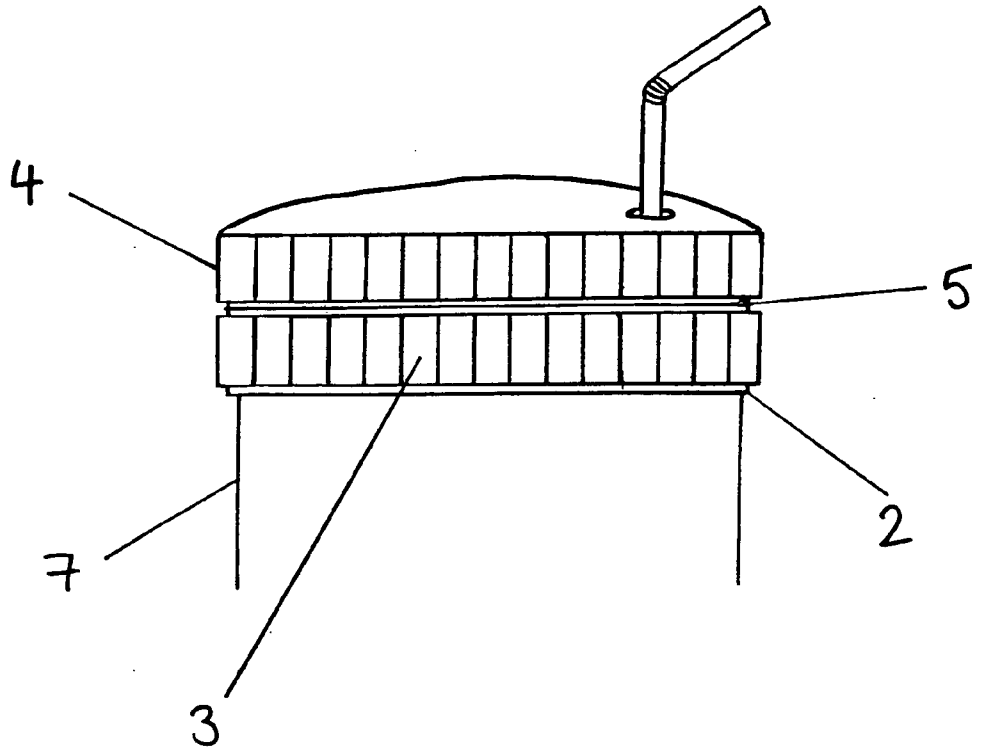


FIGURE 2

CLOSURES

[0001] The present invention relates to improvements in relation to closures and in particular to closures that provide a fluid tight seal around the top of drinking vessels. In a particular preferred embodiment the invention provides removable closures that can be secured to drinking vessels to prevent spillage if the vessels are accidentally knocked over. The invention can be particularly useful with children's drinks, a drink aid for use with the elderly and infirm and in many other comparable outlets.

[0002] A particular feature of the present invention is that the closures are removable, and also that they may be re-used. They may be purchased as a kit and carried around until required or may be supplied for use in restaurants, coffee bars, pubs and the like.

[0003] The present invention therefore provides a closure for drinking vessels comprising at least two sections, the first section is adapted for placement around the circumference of the top of the drinking vessel and the second section is adapted for attachment to the first section in a manner that covers the top of the drinking vessel and also, when attached to the first section brings the first section into contact with the exterior surface of the drinking vessel to establish a liquid tight seal therewith.

[0004] The expression the top of the drinking vessel will be understood to include at or near to the open end of the vessels so that the second section can be easily attached to the first section in a manner that covers the opening of the particular drinking vessel.

[0005] In a preferred embodiment the second section is provided with an aperture for the passage of a drinking straw and in a further preferment the aperture is provided with a gasket that forms a liquid tight seal around the drinking straw so as to prevent or minimise spillage through the aperture if the vessel is knocked over.

[0006] The invention is useful with any type of drinking vessel, the vessels may be cups, glasses or cans and may be of glass, plastic, ceramic or metal. The invention is particularly useful with drinking vessels such as glasses and cups and it may be applied in the home, on picnics or in cafes, restaurants, pubs and the like; it may also be used while travelling to avoid spillages in aircraft, trains, boats and the like. The size of the sections of the closure of the present invention will, of course, depend upon the size of the drinking vessel that is to be closed. However in many drink outlets the drinking vessels have an upper opening of between 60 mm and 75 mm in diameter. Accordingly a preferred closure of the present invention is designed to fit around and close such an opening.

[0007] The sections of the closure of the present invention may be made of any suitable material although plastic is preferred for ease of manufacture, ease of application, washability and the ability to sterilise for re-use. The first section preferably comprises a ring that conforms to the exterior share of the drinking vessel which is usually circular and the ring is provided with a flexible seal preferably of synthetic rubber that provides the liquid tight seal when it is urged into contact with the exterior surface of the vessel. The external surface of the ring may be provided with ribs or protrusions that enable it to be held around the drinking vessel during the application of the second section.

[0008] The second, top section is shaped so that it will cover the entire opening of the drinking vessel, with the possible exception of an aperture for a drinking straw. It is also provided with means around the base for interlocking with the first section to provide a liquid tight seal and also to urge the flexible seal of the first section into liquid tight contact with the exterior of the drinking vessel. The interlocking means may be a snap engagement which forces the top portion of the first section outwards whilst forcing the lower portion of the first section which is provided with the seal inwardly towards the vessel to form the liquid tight seal. We have found that the closures of the present invention can readily be applied to glasses without causing damage to the glass.

[0009] Alternatively the bottom of the upper section may be provided with a thread which can engage with a mating thread provided on the lower section so that by turning the sections relative to each other they become attached and also bring the seal provided on the lower section into contact with the exterior surface of the drinking vessel.

[0010] The upper section of the closure of the present invention may be provided with an aperture for the passage of a drinking straw into the liquid within the vessel. When this is provided it is preferred that the aperture is provided with a gasket that forms a tight seal around the straw to prevent or minimise spillage through the aperture if the drinking vessel is knocked over.

[0011] The closures of the present invention are preferably made of thermoplastic material food grade polyethylene and polypropylene being preferred as they are readily mouldable and are also readily washed out and sterilised for re-use we prefer that the closure be made by injection moulding these materials. The seal provided at the lower end of the first section should also be of food grade material and is preferably a rubber seal such as a silicone rubber seal or a seal of a styrene/isoprene or styrene/butadiene copolymer and is preferably integrally moulded with the first section. It may of course be supplied by other means but integral moulding is preferred.

[0012] The present invention is illustrated but in no way limited by reference to the accompanying figures in which

[0013] FIG. **1** is an exploded view of a closure according to the present invention and

[0014] FIG. **2** shows the closure of FIG. **1** in place on the top of a drinking vessel which may be a cup, a glass or a can.

[0015] FIG. **1** shows the closure consisting of a first lower circular section (**1**) provided with a flexible seal (**2**). The section (**1**) is also provided with ribs (**3**) to help to grip the section. The upper section (**4**) is shown unattached from the lower section (**1**) in order to show the tapered thread (**5**) at the bottom of the upper section which can interact with a corresponding section at the top of the lower section (not shown) to attach the upper section (**4**) to the lower section and also when twisted as shown by the arrows (**6**) tightens the lower section onto the vessel (**7**) as is shown in FIG. **2**.

[0016] The closures of the present invention may be supplied in any suitable manner according to the use envisaged. For example, they may be supplied with or without a drinking straw in a sterilised aseptic package for use in hospitals or in old peoples homes.

[0017] They may be supplied in pubs, restaurants and cafes packaged ready for use. Alternatively they can be provided, perhaps as packages of several closures over the counter or by mail order. In other embodiments the closure may be provided together with the drinking vessel with which it is to be used.

[0018] The closures may be appropriately decorated according to the user for example they can carry illustrations for children.

1. A closure for drinking vessels comprising at least two sections, the first section being adapted for placement around the circumference of the top of the drinking vessel and the second section is adapted for attachment to the first section in a manner that covers the top of the drinking vessel and also, when attached to the first section brings the first section into contact with the exterior surface of the drinking vessel to establish a liquid tight seal therewith.

2. A closure according to claim **1** in which the second section is provided with an aperture for the passage of a drinking straw.

3. A closure according to claim **2** in which the aperture is provided with a gasket that forms a liquid tight seal around the drinking straw so as to prevent or minimise spillage through the aperture if the vessel is knocked over.

4. A closure according to claim **1** designed to fit around and close such an opening of between 50 mm and 75 mm in diameter.

5. A closure according to claim **1** in which the sections are made of plastic.

6. A closure according to claim **3** in which the first section comprises a ring that conforms to the exterior share of the drinking vessel and the ring is provided with a flexible seal preferably of synthetic rubber that provides the liquid tight seal when it is urged into contact with the exterior surface of the vessel.

7. A closure according to claim **6** in which the external surface of the ring is provided with ribs or protrusions.

8. A closure according to claim **1** in which the second section is provided with means around its base for interlocking with the first section to provide a liquid tight seal and also to urge the flexible seal of the first section into liquid tight contact with the exterior of the drinking vessel.

9. A closure according to claim **8** in which the interlocking means comprises a snap engagement which forces the top portion of the first section outwards whilst forcing the lower portion of the first section which is provided with the seal inwardly towards the vessel to form the liquid tight seal.

10. A closure according to claim **8** in which the bottom of the upper section is provided with a thread which can engage with a mating thread provided on the lower section so that by turning the sections relative to each other they become attached and the turning brings the seal provided on the lower section into contact with the exterior surface of the drinking vessel.

11. A closure system according to claim **1** packaged in a sterile package.

12. A multi pack package comprising a plurality of closure systems according to claim **11**.

13. A closure system according to claim **11** further comprising a drinking vessel with which the closure system is to be used.

14. A closure system according to claim **13** further comprising one or more drinking straws.

15. A closure according to claim **6** in which the second section is provided with means around its base for interlocking with the first section to provide a liquid tight seal and also to urge the flexible seal of the first section into liquid tight contact with the exterior of the drinking vessel.

16. A closure according to claim **15** in which the external surface of the ring is provided with ribs or protrusions.

17. A closure according to claim **15** in which the interlocking means comprises a snap engagement which forces the top portion of the first section outwards whilst forcing the lower portion of the first section which is provided with the seal inwardly towards the vessel to form the liquid tight seal.

18. A closure according to claim **16** in which the interlocking means comprises a snap engagement which forces the top portion of the first section outwards whilst forcing the lower portion of the first section which is provided with the seal inwardly towards the vessel to form the liquid tight seal.

19. A closure according to claim **15** in which the bottom of the upper section is provided with a thread which can engage with a mating thread provided on the lower section so that by turning the sections relative to each other they become attached and the turning brings the seal provided on the lower section into contact with the exterior surface of the drinking vessel.

20. A closure according to claim **16** in which the bottom of the upper section is provided with a thread which can engage with a mating thread provided on the lower section so that by turning the sections relative to each other they become attached and the turning brings the seal provided on the lower section into contact with the exterior surface of the drinking vessel.

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