Fig. 1

(57) Abstract: An anti-spill device (1) for a beverage container such as a glass or mug, wherein the beverage container (11) comprises an outer wall terminating at a lip (9) that defines an opening through which a beverage within the container can be drunk, said anti-spill device (1) being insertable into the opening in the container (11), and comprising: a support (3) for a peripheral seal (5), the support comprising one or more drinking apertures (13) through which beverage within the container (11) may be drunk; means (7), coupled to said support (3), for engaging with the lip (9) of the container (11) to limit the extent to which the anti-spill device (1) can be inserted into the opening of the container (11); and a resiliency deformable peripheral seal (5) coupled to said support (3), said seal (5) being configured to deform and seal against an inside surface of said container (11) when the anti-spill device (1) is inserted into the opening in the container (11).
ANTI-SPILL DEVICE

Field
This invention relates to anti-spill devices, particularly but not exclusively for beverage containers such as mugs or glasses.

Background
A variety of congenital and acquired conditions can lead to tremors. For example, sufferers of diseases such as Parkinson's often suffer from involuntary tremors, and when consuming beverages it can be embarrassing for such persons as hand tremors can cause them to spill their beverage.

To combat such problems it has previously been proposed to provide specialist anti-spill drinking vessels, a variety of which are offered for sale by a company called "Essential Aids" whose office is located at 32 Guildford Road, Brighton, East Sussex, United Kingdom (see: www.essentialaids.com and http://www.essentialaids.com/cups-mugs-1626-0.html ).

Whilst these devices do help alleviate the spillage problems that hand tremors can cause, they typically comprise a vessel with a spouted lid or cover and hence are immediately identifiable as being unusual, non-standard drinking vessels. Furthermore, their passing resemblance to an infant training cup can make it embarrassing for grown persons to use them in public. Another problem is that beverages in a bar or pub, for example, will tend to be served in traditional glasses (such as a pint glass), and a person who wanted to use one of these anti-spill vessels would either have to ask the person manning the bar to serve their drink in the anti-spill vessel (which could naturally prompt questions as to why the individual concerned is using such a vessel), or would have to transfer the beverage from the glass provided by the bar into their own anti-spill vessel - a process that may well lead to spillages.

The present invention has been devised with the foregoing problems in mind. In particular, one aspect of the present invention seeks to provide a discreet anti-spill device that can be fitted into a range of standard beverage containers to convert that container into an anti-spill vessel.

Summary
In accordance with a presently preferred embodiment of the present invention, there is provided an anti-spill device for a beverage container such as a glass, wherein the beverage container comprises an outer wall terminating at a lip that defines an
opening through which a beverage within the container can be drunk, said anti-spill device being insertable into the opening in the container, and comprising: a support for a peripheral seal, the support comprising one or more drinking apertures through which beverage within the container may be drunk; means, coupled to said support, for engaging with the lip of the container to limit the extent to which the anti-spill device can be inserted into the opening of the container; and a resiliency deformable peripheral seal coupled to said support, said seal being configured to deform and seal against an inside surface of said container outer wall when the anti-spill device is inserted into the opening in the container.

It will be apparent from the foregoing that the disclosed device provides an effective means for avoiding spillage of beverage from a container. The device disclosed is more discreet than previously proposed devices that tend to look more like an infant training cup, and can more easily be carried on the person than previously proposed devices. Furthermore, as the device can be used with a variety of differently sized drinking vessels, so one can avoid having to transfer beverages from standard vessels (such as coffee mugs, pint glasses or wine glasses) into a specialist drinking vessel, or indeed having to ask persons serving beverages to fill a special cup.

In a preferred embodiment, the means for engaging with the lip of the container is configured so that it also facilitates removal of the anti-spill device from the container.

This is particularly advantageous as persons suffering from tremors can often have trouble picking up objects, and hence may struggle to remove the anti-spill device.

The means for engaging with the lip of the container may comprise one or more arms extending radially outwardly from the support. The one or more arms may each have a curved portion that is configured to hook over the rim of the container when the device is inserted into the opening. In a preferred arrangement, said one or more arms each extend outwardly from the support and beyond the periphery of the deformable peripheral seal.

The support may comprise a generally planar body, and said one or more drinking apertures may each extend through the support to define a channel that is inclined relative to the plane of the support. The or each channel may be radially inwardly or outwardly inclined relative to said planar support.

In a particularly preferred arrangement, the support and/or seal may be configured so that beverage spilling through the one or more drinking apertures tends to drain back into the container via each said drinking aperture.

The device may have only one drinking aperture and said drinking aperture may be closer to one side of the peripheral seal than the other side of the seal. Alternatively
the support may have a plurality of drinking apertures and in one arrangement two of
such apertures may be located different distances from the outermost edge of the
peripheral seal.

The outer periphery of the peripheral seal defines a notional area, and a central
portion of the support for a peripheral seal may be offset relative to a central portion of
the notional area.

The support and said engagement means may be integrally formed with one
another. The support and the peripheral seal may be integrally formed with one another. The support and the seal may be formed by a two-shot injection moulding process.

Another aspect of the present invention relates to an anti-spill device that is
push-fittable into an open mouth of a drinking vessel, the device being configured to
deform against a peripheral inside wall of the vessel to form a seal and thereby reduce
spillage from the vessel, said device having one or more apertures therein through which
a fluid within the vessel can be drunk.

The device may have only one aperture through which a fluid within the vessel
can be drunk and said aperture may be closer to one side of the anti-spill device than
the other side thereof. Alternatively the device may have two apertures through which a
fluid within the vessel can be drunk and said apertures may each be located different
distances from the periphery of the anti-spill device.

In preferred embodiments, the anti-spill device is sized and configured so as to
be push-fittable into a standard coffee mug, a standard pint glass and a standard wine
glass.

Other features, aspects and advantages of the teachings of the present invention
will be apparent from the following detailed description.

**Brief Description of the Drawings**

Various aspects of the teachings of the present invention, and arrangements
embodied those teachings, will hereafter be described by way of illustrative example
with reference to the accompanying drawings, in which:

- Fig. 1 is a schematic perspective view of an anti-spill device according to an
  aspect of the present invention;
- Fig. 2 is a schematic representation of the device in Fig. 1 in use.
- Fig. 3 is a schematic perspective view of a support for the device of Fig. 1;
- Fig. 4 is a front elevation of the support depicted in Fig. 3;
- Figs. 5 and 6 are top and underneath plan views, respectively, of the support
depicted in Fig. 3;
Fig. 7 is a schematic perspective view of a peripheral seal for the device of Fig. 1; and

Fig. 8 is a front elevation of the seal depicted in Fig. 7; and

Fig. 9 is a schematic perspective view of an anti-spill device according to another aspect of the present invention.

**Detailed Description**

Fig. 1 of the accompanying drawings is a schematic perspective view of an anti-spill device 1. Fig. 2 is a schematic representation of the anti-spill device 1 installed in a beverage container, in this particular example a mug 11.

The anti-spill device 1 comprises a support 3 and a resiliency deformable peripheral seal 5. Means 7 (in this instance a pair of arms) coupled to the support 3 engage with a lip 9 that defines an opening in the mug 11 to limit the extent to which the anti-spill device can be inserted into the mug 11. In a preferred implementation, the rim engaging means 7 also facilitates removal of the device from a mug 11 into which it has been inserted.

The support 3 comprises at least one aperture 13 through which a beverage in the container 11 can be drunk. In this particular example, two apertures are provided and this arrangement is preferred as the second aperture allows for pressure equalisation, thereby avoiding the creation of a negative pressure within the mug 11 when a user drinks from it. Although it is preferred for the aperture(s) to be provided in the support, it will be appreciated that one or more apertures may be provided in the seal. It is also conceivable for a drinking aperture to be provided in the support, and a pressure equalisation hole to be provided in the seal, or vice versa.

At least a peripheral portion of the resiliency deformable peripheral seal is configured to deform upwardly (i.e. towards the opening defined by the rim 9) as the anti-spill device 1 is pushed into the mug 11. As will be appreciated, the resilient nature of the deformed seal causes it to bear against the inside surface of the mug to seal against egress of fluid from within.

In one envisaged arrangement, the components of the anti-spill device may be formed as discrete components and then joined one to the other. In another envisaged implementation, the support 3 and rim engaging means 7 are formed as one component, and the seal 5 is separately formed and then coupled to the support 3. In yet another implementation, all three components are formed together, for example by means of a two-shot injection moulding process.

The support and rim engaging means are formed from a relatively rigid plastics
material, whereas the seal is formed from a resiliently flexible material, such as an elastomer. In a particularly preferred implementation one or more of the component parts of the anti-spill device may be formed from a thermochromic material that changes colour when exposed to a hot liquid, the colour change providing an indication to the user that care should be taken as the contents of the container are hot.

Referring now to Figs. 3 and 4, the support 3 comprises a generally planar circular body 15 from one side of which the aforementioned rim engagement means 7 extend. The circular body 15 includes a peripheral groove 17 into which a complementary rib 19 (Fig. 7) on the seal 5 extends when the support 3 and seal 5 are coupled together.

In a preferred implementation the aperture(s) 13 in the support 3 are inclined relative to the plane defined by the support 3, as we have found that with such an arrangement fluid is less likely to escape from the mug 11 when the mug is shaken than if the apertures were to extend in a direction perpendicular to the plane of the support. In the arrangement depicted in the drawings, the apertures are radially outwardly inclined (in a direction towards the rim engaging means), but it will be appreciated that they could instead be radially inwardly inclined if so desired. Figs. 5 and 6 are top and underneath plan views, respectively, of the support showing - inter alia - the inclined nature of the apertures 13.

As shown in Fig. 4, and as aforementioned, in a preferred implementation the rim engaging means 7 comprises a pair of arms that extend upwardly and outwardly from the planar support 3. As shown in Fig. 4, a peripheral portion 21 of each said arm is curved so that the arms can hook over the rim 9 of the mug 11 to limit the extent to which the anti-spill device 1 can be pushed into the mug 11.

Referring now to Figs. 7, and 8, the peripheral seal comprises an annular body with the aforementioned rib 19 extending radially inwardly from a wall bounding the hole in the annulus. As shown in Fig. 8, a peripheral region 23 of the seal 5 reduces in depth so that it is generally triangular in cross-section. As the anti-spill device is pushed into the open end of a mug, or other beverage container, so the peripheral region of the seal 5 tends to bend in the direction indicated by the arrow labelled “A” (i.e. towards the rim of the container into which the device is being pushed), and the seal bears and seals against the inside surface of the container.

In this configuration, at least the peripheral part 23 of the seal tends to be closer to the rim than the support, and as a consequence any fluid that should happen to escape through the drinking aperture(s) 13 will tend to flow back towards those apertures and back into the container. In a particularly preferred implementation, the
support may be shaped to facilitate this.

Furthermore, in another envisaged arrangement (see Fig. 9) the support 3 is centrally offset relative to the outer periphery of seal 5. This provides that one of the apertures 13 is located closer to the outer periphery of the seal 5 than the other aperture 13. Similarly, in the case when the anti-spill device 1 only has a single aperture 13, the aperture 13 may be closer to one side of the peripheral seal 5 than the other.

Another way of describing this is by saying that the outer periphery of the seal 5 encloses a notional area. In the envisaged arrangement described in the foregoing paragraph a central portion of the support 3 is offset relative to a central portion of the notional area enclosed by the outer periphery of the seal 5.

The arrangements envisaged in the two preceding paragraphs are applicable to the case when the anti-spill device comprises a support 3 coupled to a separate seal 5 and equally to the case when the anti-spill device comprises a single element.

It can be seen from the foregoing that the teachings of the present invention provide a device that is much less conspicuous than previously proposed infant trainer style cups. The device has been tested with a variety of different containers, such as coffee mugs, tea cups, pint glasses and wine glasses, and has been found to fit the majority of those tested. As such the device disclosed provides a viable way of addressing at least some of the day-to-day needs of a person with hand tremors.

It will be appreciated that whilst various aspects and embodiments of the present invention have heretofore been described, the spirit and scope of the present invention is not limited to the particular arrangements set out herein and instead extends to encompass all arrangements, and modifications and alterations thereto, which fall within the scope of the appended claims.

For example, in Figs. 1 and 2, the support is depicted as having a central part of similar material to that of the seal (formed by material provided in a depression 25 formed in the upper surface of the support 3 (see Fig. 3)). In one envisaged implementation this material is largely decorative, but it is envisaged that it could be of thermochromic material to provide a visible warning that the contents of the container are hot. The material could, alternatively, be omitted without inhibiting proper functioning of the device.

It should also be noted that whilst the accompanying claims set out particular combinations of features described herein, the scope of the present invention is not limited to the particular combinations hereafter claimed, but instead extends to encompass any combination of features herein disclosed.
CLAIMS

1. An anti-spill device for a beverage container such as a glass, wherein the beverage container comprises an outer wall terminating at a lip that defines an opening through which a beverage within the container can be drunk, said anti-spill device being insertable into the opening in the container, and comprising:
   a support for a peripheral seal, the support comprising one or more drinking apertures through which beverage within the container may be drunk;
   means, coupled to said support, for engaging with the lip of the container to limit the extent to which the anti-spill device can be inserted into the opening of the container; and
   a resiliency deformable peripheral seal coupled to said support, said seal being configured to deform and seal against an inside surface of said container when the anti-spill device is inserted into the opening in the container.

2. A device according to Claim 1, wherein the means for engaging with the lip of the container is configured so that it also facilitates removal of the anti-spill device from the container.

3. A device according to Claim 1 or 2, wherein the means for engaging with the lip of the container comprises one or more arms extending radially outwardly from the support.

4. A device according to Claim 3, wherein said one or more arms each have a curved portion configured to hook over the rim of the container when the device is inserted into the opening.

5. A device according to Claim 3 or 4, wherein said one or more arms each extend outwardly from the support and beyond the periphery of the deformable peripheral seal.

6. A device according to any preceding claim, wherein said support comprises a generally planar body, and said one or more drinking apertures each extend through the support to define a channel that is inclined relative to the plane of the support.

7. A device according to Claim 6, wherein said channel is radially inwardly or outwardly inclined relative to said planar support.
8. A device according to any preceding claim, wherein said support and/or said seal is or are configured so that beverage spilling through the one or more drinking apertures tends to drain back into the container via each said drinking aperture.

9. A device according to any preceding claim, wherein said device has only one drinking aperture and said drinking aperture is closer to one side of the peripheral seal than the other side of the seal.

10. A device according to any of Claims 1 to 8, wherein the support comprises a plurality of drinking apertures.

11. A device according to Claims 10, wherein two of said drinking apertures are located different distances from the outermost edge of the peripheral seal.

12. A device according to any preceding claim, wherein i) the outer periphery of the peripheral seal defines a notional area and ii) a central portion of the support for a peripheral seal is offset relative to a central portion of the notional area.

13. A device according to any preceding claim, wherein said support and said engagement means are integrally formed with one another.

14. A device according to any preceding claim, wherein said support and said peripheral seal are integrally formed with one another.

15. A device according to Claim 14, wherein said support and seal are formed by a two-shot injection moulding process.

16. An anti-spill device that is push-fittable into an open mouth of a drinking vessel, the device being configured to deform against a peripheral inside wall of the vessel to form a seal and thereby reduce spillage from the vessel, said device having one or more regions through which a fluid within the vessel can be drunk.

17. A device according to Claim 16, wherein said device has only one region through which a fluid within the vessel can be drunk and said region is closer to one side of the anti-spill device than the other side thereof.
18. A device according to Claim 16, wherein said device has two regions through which a fluid within the vessel can be drunk and said regions are each located different distances from the periphery of the anti-spill device.

19. An anti-spill device according to any preceding claim, wherein the device is sized and configured so as to be push-fittable into a standard coffee mug, a standard pint glass and a standard wine glass.

20. An anti-spill device substantially as hereinbefore described with reference to and/or as shown in the accompanying drawings in Figs. 1 to 8.

21. An anti-spill device substantially as hereinbefore described with reference to and/or as shown in the accompanying drawing in Fig. 9.
A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

INV. A47G19/22

ADD.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47G B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search: 16 October 2012

Date of mailing of the international search report: 25/10/2012

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