

Tamper Evident Cap

The present invention relates to a cap and in particular, although not exclusively, to a tamper evident cap for a container for a pourable substance.

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It is often necessary to provide an indication that a container has been opened. Such an indication may be provided by a device such as a security seal, the removal of which may indicate fraudulent tampering of the container contents. Such a device may also ensure that a container which has been used for the first time is clearly identifiable; this
10 may be important if the contents have a limited shelf life once opened to the atmosphere.

It is known to provide such an indication by using a frangible split ring on a container cap. When complete, the ring inhibits removal of the cap. Once the ring has been
15 manually removed the user, retailer or supplier has an indication that the container may have been opened. The ring and cap arrangement may, therefore, provide a deterrent to tampering by third parties and may also act as a security seal.

Several problems are associated with known tamper evident security devices. Firstly it
20 is not always possible to immediately determine whether the ring has been removed from the cap. The consumer may for example not be aware that such a ring should be present. Even when the ring has been removed it may be later hidden, e.g. by a shrink wrap sleeve. Secondly in the case of a removable split ring the cap can sometimes be prised off the container without complete removal of the ring. It may also be possible to
25 reattach the ring, by for example welding or gluing, thereby removing the indication that the cap has been tampered with or removed.

A further problem associated with prior art caps is that it is not always possible to determine at a glance which container out of many has been opened and used. This may
30 have a significance in, for example, a doctor's surgery or in food preparation where certain products have limited shelf life once opened.

What is required is a tamper evident cap for a container for a pourable substance with an improved indication of possible tampering. It would also be desirable to provide a visible indication that the contents of a container have been dispensed.

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According to the invention there is provided a tamper evident cap for a container for pourable substances, the cap comprising a pouring neck for attachment to the opening of a container, and a closure for the mouth of said neck, the neck comprising a substantially closed chamber surrounding a pouring aperture, the chamber having an opening for communication with said aperture and being adapted to define a well in the upright condition of the container wherein in use a pourable substance in the chamber is visible from the exterior thereof.

A device so arranged has the advantage that the pourable substance provides a visible indication that the contents have been dispensed from the container. The pourable substance may also provide the indication that the cap has been tampered with. It has been found that the pourable substance in the well defined by the chamber is difficult to remove. This has the advantage that once the indication is made it cannot be easily removed.

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Typically the closure and the neck are provided with co-operating screw threads. Preferably the closure has a female thread and the neck has a male thread. Alternatively the neck may be provided with a snap fitting closure.

25 In a preferred embodiment the closure is adapted to prevent communication between the chamber and the aperture. A closure so adapted inhibits the pourable substance entering the chamber when the closure is located on the neck, thus obviating accidental entry of substance into the well by agitation, for example during transport and handling of the containers.

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In a preferred embodiment this is achieved by providing the inner surface of the neck with a circular flange extending radially inwardly, and downwardly relative to the well.

The closure has a depending sleeve, the free end of the sleeve being adapted to abut against the flange to prevent said communication. In a preferred embodiment the free end of the sleeve has an annular surface corresponding to the angle of the downwardly projecting flange.

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Preferably the free edge of the flange has a plurality of inwardly radially extending arms which meet at the middle, said arms defining holes which allow communication through the pouring aperture. Such arms tend to retain the shape and position of the flange.

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Advantageously the well is circumferentially continuous and is defined by a base, an external wall, an upper wall and the wall of said neck, said outer wall being transparent. In an alternative embodiment the outer wall is translucent to hide the inner structure of the cap, providing always that the pourable substance is visible through the outer wall. The degree of translucence may for example depend on the colour of the pourable substance.

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In a preferred embodiment a plurality of said openings are provided, each being defined between the upper wall and the wall of said neck. Preferably the upper wall is a continuously radial flange of said neck.

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A neck so arranged has the advantage of being able to be moulded from two components of plastic. The two components may thus be welded or clipped together to form the cap whilst defining the openings. The components may also be moulded from different types, colours and grades of plastic. This has the advantage of providing the necessary flexibility, rigidity or physical appearance of the given part as required for function or aesthetic design.

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Advantageously the external wall has a skirt which extends below the base, said skirt having a snap fitting on the inside thereof, and adapted to provide a snap fit for attachment to e.g. a neck of the opening of the container. Other means of secure

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attachment to a container are suitable, such as a one-way thread arrangement or a permanent fixing, such as by adhesive, welding or the like.

Other features of the invention will be apparent from the following description of a preferred embodiment shown by way of example only in the accompanying drawings, in which;

- Figure 1 is a series of diagrammatic representations of a pouring neck according to the present invention.
- 10 - Figure 2 is a series of diagrammatic representations of a flanged collar according to the present invention.
- Figure 3 is a series of diagrammatic representations of a closure according to the present invention.
- Figure 4 is a series of diagrammatic representations of a tamper evident cap according to the present invention.
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Referring firstly to Figure 1, there is shown a pouring neck in accordance with the present invention, generally designated 10. The pouring neck 10 has a well 12 in the upright condition as illustrated in Figure 1c. The well 12 is circumferentially continuous, as illustrated in Figure 1a, and has an inner wall 14, a base 15 and a transparent outer wall 16. The inner surface of the neck 10 has a continuous circular flange 18 extending radially inwardly, and downwardly relative to the well. The free edge of the flange 18 has a plurality of inwardly radially extending arms 20. The arms 20 meet at the centre and define hole 22 which form the apertures to allow communication through the pouring neck.

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Further shown in Figure 1 is a plurality of castellations 23 of the inner wall, which define openings 24 for communication between the pouring neck and the well 12. The external wall has a skirt 26 which extends below the base 15. The skirt 26 has a snap fitting on the inside thereof and a plurality of moulded recesses 27 on the outside thereof. The snap fitting is adapted to provide the attachment to the opening of a container (not shown) and the recesses 27 provide a means of gripping the neck 10. Any

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suitable means of attaching the neck to the container in a permanent manner is appropriate, for example a one-way screw attachment.

Figure 2 illustrates a collar according to the present invention, generally designated 30.

5 The collar 30 defines a mouth 32 and has a circumferential flange 34. The exterior surface of the collar 30 has a screw thread 36 and the interior surface of the collar 30 has a plurality of circumferentially spaced legs 38. The legs 38 also define the openings 24 illustrated in Figure 1 as will become apparent. The flange 34 is the upper wall of the well 12 illustrated in Figure 1.

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Figure 3 illustrates a closure according to the present invention, generally designated 40. The closure 40 has an internal screw thread 42 which cooperates with the collar screw thread 36 illustrated in Figure 2b. The closure 40 has a depending sleeve 44 with a tapered free end 46. The exterior surface of the closure has a plurality of moulded

15 recesses 48 to provide a gripping surface.

Figure 4 illustrates a tamper evident cap according to the present invention, generally designated 50. Figure 4a illustrates the cap 50 which comprises the neck 10, the collar 30 and the cap 40. The free edge of the flange 34 and the exterior wall 16 of the neck 10 are welded 52 which substantially closes the well 12 to form a chamber 54 surrounding the neck 10. The openings 24 which communicate the chamber 54 with the aperture are defined between the flange 34 of the collar 30 and the inner wall 14 of the neck 10.

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The closure 40 is adapted so that when it is screwed onto the collar 30 it prevents communication between the chamber and the aperture. This is achieved by the taper 46 which has an annular surface corresponding to the angle of the downwardly projecting flange 18. The taper 46 of the closure 40 is adapted to abut against the flange 18 of the neck 10 and provides a seal against the transfer of pourable substance to the chamber.

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30 The cap 50 may be used with a container for a liquid or for pourable substance such as a granulated powder. During transit of the container the closure 40 prevents the pourable substance entering the chamber 54. When the closure 40 is removed from the mouth 32

of the neck 10 and the contents of the container are dispensed for the first time, by tipping the container, some of the pourable substance enters the chamber 54 and remains in the well 12 when the container is upright. The substance in the well 12 is visible through the transparent outer wall 16 and provides a clear indication that the contents have been dispensed from the container. The substance cannot easily be removed from the well 12 since any attempt at tipping the container results in the substance travelling around the circumference of the neck 10 within the well 12.

The diameter of the aperture may be between 6 - 15 times the width of the well 12. The height of the well 12 may be between 1 - 3 times the width of the well 12.

Whilst a preferred embodiment for the device has been described it will be appreciated that many other designs of the neck exist that would have the desired effect of the invention with the proviso that the pourable substance is visible through the exterior wall of the well.

Claims

1. A tamper evident cap for a container for pourable substances, the cap comprising a pouring neck for attachment to the opening of a container, and a closure
5 for the mouth of said neck, the neck comprising a substantially closed chamber surrounding a pouring aperture, the chamber having an opening for communication with said aperture and being adapted to define a well in the upright condition of the container wherein in use a pourable substance in the chamber is visible from the exterior thereof.

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2. A cap according to claim 1 wherein the closure and the neck are provided with co-operating screw threads.

3. A cap according to claim 2 wherein the closure has a female thread and the
15 neck has a male thread.

4. A cap according to any preceding claim wherein the closure is adapted to prevent communication between the chamber and the aperture.

20 5. A cap according to claim 4 wherein the inner surface of the neck has a circular flange extending radially inwardly, and downwardly relative to the well, the closure having a depending sleeve, the free end of said sleeve being adapted to abut against the flange to prevent said communication.

25 6. A cap according to claim 5 wherein the free end of said sleeve has an annular surface corresponding to the angle of the downwardly projecting flange.

7. A cap according to claim 5 wherein the free edge of the flange has a plurality of inwardly radially extending arms mutually connected at their inner ends, said arms
30 defining holes to permit flow through said pouring aperture.

8. A cap according to any preceding claim wherein the well is circumferentially continuous and is defined by a base, an external wall, an upper wall and the wall of said neck, said outer wall being transparent.

5 9. A cap according to claim 8 wherein a plurality of said openings are provided, each being defined between the upper wall and the wall of said neck.

10. A cap according to any of claim 8 or claim 9 wherein the upper wall is a continuously radial flange of said neck.

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11. A cap according to any of claims 8 - 10 wherein the external wall has a skirt which extends below the base, said skirt having a snap fitting on the inside thereof, and adapted to provide a snap fit for attachment to the opening of the container.

15 12. In combination a container and a cap according to any preceding claim.

13. A cap constructed and arranged substantially as described herein with reference to the accompanying drawings.

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