

CLOSURE FOR A CONTAINER.

The present invention relates in general to an apparatus and in particular to a closure for a container.

Closures for containers are known which have tamper evident and/or tamper proof features. Such features may be provided for safety reasons, for example closures for
5 containers which are used with drugs or harmful substances.

Closures are known which comprise a cap having a retaining ring which is frangibly connected to the cap and disengaged therefrom by unscrewing the cap. Such closures are not entirely satisfactory. For example, the cap is only connected to the container at the outlet which means that they are relatively easy to tamper with and they
10 may not be very robust. Also, it is not always readily evident where the closure has been tampered with.

US5348184 relates to a unitary tamper-evident fitment and closure assembly in which a elongate moulding runner provides a tamper-evident part of the closure.

US 5094357 relates to a tamper evident seal for a container which is provided by a
15 tab which is preferably a different colour from the container. The tab extends from the closure for the container at least partially down the sidewall of the container and has means to be gripped thereon. A portion of the tab adjacent the gripping means is attached to the container and there is a frangible region surrounding the portion of the tab attached to the container whereby to open the container the gripping means is pulled
20 with sufficient force to fracture the frangible region of the tab and leave the tab portion within the frangible region attached to the container, with the remainder of the tab remaining attached to the closure. In an alternative embodiment, the seal is provided the other way around such that to open the container the gripping means is pulled with

sufficient force to fracture the frangible region of the tab leaving the tab portion within the frangible region attached to the closure, with the remainder of the tab remaining attached to the container. Therefore, there remains a need, for an improved closure for a container.

5 Thus, according to the present invention there is provided a closure for a container which comprises a cap being adapted in use to sealably engage the opening of a container, the cap having a frangible portion adapted in use to be connected through a tearing strip to the container to prevent disengagement of the cap from the opening of the container and the frangible portion being removable from the cap by pulling on the
10 tearing strip, thereby in use, allowing the cap to be disengaged from sealable engagement with the opening of the container.

One advantage of the present invention is that the presence of the frangible portion of the cap can provide clear visible evidence of whether the closure has been at least partially disengaged from the container. This advantage has a benefit of deterring
15 counterfeiters and also deterring or hindering unauthorised re-use of the container in combination with a new or alternative closure.

Another advantage of the present invention is that in use, removal of the frangible portion from the cap provides a gap in the cap, which gap may improve gripping of the cap and thereby assist in removing the cap from the container.

20 Preferably, the cap has a screw thread which in use, co-operates with a corresponding screw thread on an outlet neck of the container. Preferably, the cap has a tubular part which has a screw thread which in use, co-operates with a corresponding screw thread on the outlet neck of the container. Preferably, the tubular part has a screw thread on its inner surface which co-operates with a corresponding screw thread on the
25 outer surface of the outlet neck of the container (so-called, "screw-on cap").

Alternatively, the tubular part has a screw thread on its outer surface which co-operates with a corresponding screw thread on the inner surface of the outlet neck of the container (so-called, "screw-in cap").

30 The cap may sealably engage and disengage the opening of the outlet neck by screwing and unscrewing respectively the cap. The ability of the cap to screw and unscrew is however determined by the presence of the frangible portion the cap. Thus, when the frangible portion of the cap is intact with the tearing strip connected to the

container, the cap can not be unscrewed from the container. When the frangible portion of the cap is removed by pulling on the tearing strip, the cap can be unscrewed from the container. Removal of the frangible portion from the cap provides a gap in the cap, which gap may improve gripping of the cap and thereby assist in removing the cap from the container.

The cap may be manufactured of one or more plastics materials. Suitably, the plastics material may comprise a thermoplastic polymer, for example comprising polypropylene homopolymer and/or copolymer. A suitable polypropylene copolymer may be a propylene/ethylene copolymer, for example containing 5 – 15 % polyethylene.

The cap may be manufactured using injection moulding or compression moulding.

The cap may be manufactured of one or more differently coloured plastics materials.

The cap may be a suitable ergonomic shape. Preferably the cap is hexagonal in shape. This has an advantage of providing a good gripping shape especially if the user's hands are wet or oily. Alternatively, the cap may have a non-regular shape, for example with just one flat surface having the frangible portion. This may have an advantage of using less material to manufacture.

The cap may be moulded to include a trade mark, logo or other distinguishing feature. The cap may be printed and/or labelled with a trade mark, logo or other distinguishing feature. The printing may be uv printing. The labelling may be external or mould labelling. These have an advantage of further deterring counterfeiting. The cap may be of a single colour or multi-coloured. The trademark, logo or other distinguishing feature may be of the same colour and/or material as the rest of the cap or a different colour and/or material as the rest of the cap.

The cap may also comprise a wag, which is an insert of flexible material which in use, sealably engages the outlet of the container. The wag may comprise a flexible membrane. The wag may comprise more than one layer. Suitably the wag comprises a layer of polyethylene foam and a layer of aluminium. The layer of aluminium may be inductively sealed to the outlet of the container and may further have a trade mark, logo or other distinguishing feature thereon.

An advantage of a screw-in type cap is that it may not need a wag.

The frangible portion is suitably manufactured integral with the cap. The frangible portion may have one or more lugs which are broken when the frangible portion is removed from the cap. The frangible portion may have a continuous thin portion of material which is broken when the frangible portion is removed from the cap.

- 5 The frangible portion of the cap may comprise a softer material than the remainder of the cap. The frangible portion of the cap may comprise a composite material. Thus, part of the frangible portion may be moulded with the remainder of the cap and then a second, preferably softer, material may be moulded into the frangible portion, to form a composite material. An advantage of the use of a composite material may be the use of
10 less of a more expensive softer material.

The frangible portion may have a key shape.

The tearing strip may be integral with the frangible portion of the cap, or may be connected thereto.

The tearing strip may be manufactured of one or more plastics materials.

- 15 Suitably, the plastics material may comprise a thermoplastic polymer, for example comprising polypropylene homopolymer and/or copolymer. A suitable polypropylene copolymer may be a propylene/ethylene copolymer, for example containing 5 – 15 % polyethylene. The tearing strip may be manufactured using injection moulding or compression moulding.

- 20 The tearing strip may be manufactured of one or more differently coloured plastics materials.

The tearing strip may be manufactured by moulding with the cap.

- The tearing strip may comprise one or more wires. The one or more wires may be manufactured of metal. If the cap is manufactured of plastics material by moulding, the
25 one or more wires may be moulded into the frangible portion when the cap is manufactured. The one or more wires of the tearing strip may be connected to a connecting pad, which is adapted in use to be connected to the container. The connecting pad may be manufactured of one or more plastics materials. Suitably, the plastics material may comprise a thermoplastic polymer, for example comprising
30 polypropylene homopolymer and/or copolymer. A suitable polypropylene copolymer may be a propylene/ethylene copolymer, for example containing 5 – 15 % polyethylene. The connecting pad may be manufactured using injection moulding or compression

moulding. If the connecting pad is manufactured of plastics material by moulding, the wires may be moulded into the connected pad when it is manufactured.

The tearing strip may be moulded to include a trade mark, logo or other distinguishing feature. The tearing strip may printed and/or labelled with a trade mark, logo or other distinguishing feature. The printing may be uv printing. The labelling may be external or mould labelling. These have an advantage of further deterring counterfeiting. The tearing strip may be of a single colour or multi-coloured. The trademark, logo or other distinguishing feature may of the same colour and/or material as the cap or a different colour and/or material as the cap.

The frangible portion and/or tearing strip may have a trade mark, logo or other distinguishing feature on a hidden side, such that when the frangible portion and/or tearing strip are removed, the trade mark, logo or other distinguishing mark may be revealed. Such a distinguishing mark may be a prize number or the like.

The tearing strip and/or connecting pad may be connected to the container by heat sealing, ultra sound sealing or friction sealing. The tearing strip and/or connecting pad may be connected to the container by use of an adhesive.

The container may have a curved surface to facilitate alignment of the tearing strip with the surface of the container when the closure is fixed to the container during manufacture.

The closure of the present invention may be associated with a container. The container may have an outlet neck and opening therein. The container is preferably suitable for containing liquids. Typically, the container is suitable for containing liquids such as lubricating oils especially automotive lubricating oils, e.g. hydrocarbon or synthetic lubricating oils. The container is also suitable for containing liquids such as harmful or dangerous chemicals such as fuel additives, anti-freeze compositions, brake fluids and the like.

Preferably, the container is manufactured of plastics material. The plastics material may comprise one or more polyolefins, optionally in combination with other polymers. Suitable polyolefins include high density polyethylene and polypropylene.

The container may be of one or more colours. The container may be labelled and/or printed (for example uv printed). Suitable containers range in size from 100 ml. to 50

litres, for example 100ml, 250 ml, 1litre, 5 litre and 7.5 litre bottles and 15 litre, 20 litre and 50 litre drums.

The closure and container may be printed and/or labelled with batch numbers and/or other identification marks, for example with part of the number and/or mark on the closure and the remaining part on an adjacent part of the container.

Removal of the frangible portion and/or tearing strip may reveal a trade mark, logo or other distinguishing feature on the container. Such a distinguishing mark may be a warning that the closure has been used or tampered with.

The invention will now be described by way of example only and with reference to Figures 1 and 2 in which Figure 1 represents in general view, a container with a closure according to the present invention and Figure 2 represents in general view, a closure according to the present invention.

Referring to the drawings, the closure according to the present invention comprises a cap (1) being adapted in use to sealably engage the opening (not shown) of a container (2), the cap having a frangible portion (3) adapted in use to be connected through a tearing strip (4,5) to the container (2) to prevent disengagement of the cap from the opening of the container and the frangible portion (3) being removable from the cap (1) by pulling on the tearing strip (4,5), thereby in use, allowing the cap (1) to be disengaged from sealable engagement with the opening of the container.

In Figure 1, the tearing strip (4) is integral with the frangible portion (3) of the cap. The tearing strip and frangible portion, for example, may comprise plastics material and may be moulded with the cap. In Figure 1 the frangible portion (3) is shown with a trade mark (10) moulded therein.

In Figure 2, the tearing strip (5) comprises two wires (6), connecting the frangible portion (3) to a connecting pad (7). The wires, for example, may be moulded into the frangible portion (3) and connecting pad (7) when these parts are manufactured of plastics material.

The tearing strip (4) of Figure 1 and the connecting pad (7) of Figure 2 are connected to the container, for example by heat sealing, ultra sound sealing or friction sealing or by use of an adhesive.

In the figures, the cap is hexagon which aids grip, especially if the user's hands are wet or oily. Grip may also be assisted in use by the gap formed when the frangible

portion of the cap is removed. The cap (1) has a tubular part (11) which has screw thread (8) on its inner surface which in use, co-operates with a corresponding screw thread (not shown) on the outlet neck (9) of the container. The cap has a wag (12) which is an insert of flexible material which in use, sealably engages the outlet of the container. Suitably, the wag comprises a layer of polyethylene foam and a layer of aluminium.

The cap (1) may sealably engage and disengage the opening of the outlet neck by screwing and unscrewing respectively the cap. The ability of the cap to screw and unscrew is however determined by the presence of the frangible (3) portion the cap. Thus, when the frangible portion of the cap is intact and connected through the tearing strip (4,5) to the container, disengagement of the cap from the opening of the container is prevented.

When the frangible portion of the cap (1) is removed by pulling on the tearing strip (4,5), the cap can be unscrewed from the container (2).

The container shown in the drawings may be suitable for containing liquids such as lubricating oils especially automotive lubricating oils, e.g. hydrocarbon or synthetic lubricating oils. The container is also suitable for containing liquids such as harmful or dangerous chemicals such as fuel additives, anti-freeze compositions, brake fluids and the like.

Claims :

1. A closure for a container which comprises a cap being adapted in use to sealably engage the opening of a container, the cap having a frangible portion adapted in use to be connected through a tearing strip to the container to prevent disengagement of the cap from the opening of the container and the frangible portion
5 being removable from the cap by pulling on the tearing strip, thereby in use, allowing the cap to be disengaged from sealable engagement with the opening of the container.
2. A closure as claimed in claim 1 in which the cap has a screw thread which in use, co-operates with a corresponding screw thread on an outlet neck of the container.
3. A closure as claimed in any one of the preceding claims in which the cap is
10 manufactured of one or more plastics materials.
4. A closure as claimed in claim 3 in which the one or more plastics materials comprise a thermoplastic polymer, for example comprising polypropylene homopolymer and/or copolymer.
5. A closure as claimed in claim 3 or claim 4 in which the cap is manufactured using
15 injection moulding or compression moulding.
6. A closure as claimed in any one of the preceding claims in which the cap is hexagonal in shape.
7. A closure as claimed in any one of the preceding claims in which the frangible portion is manufactured integral with the cap.
- 20 8. A closure as claimed in any one of the preceding claims in which the cap has a continuous thin portion of material which is broken when the frangible portion is removed from the cap.

9. A closure as claimed in any one of the preceding claims in which the frangible portion of the cap comprises a composite material.
10. A closure as claimed in any one of the preceding claims in which the frangible portion has a key shape.
- 5 11. A closure as claimed in any one of the preceding claims in which the tearing strip is integral with the frangible portion of the cap.
12. A closure as claimed in any one of claims 1 to 11 in which the tearing strip comprises one or more wires.
13. A closure as claimed in claim 12 in which the one or more wires of the tearing
10 strip are connected to a connecting pad, which is adapted in use to be connected to the container.
14. A closure as claimed in any one of claims 1 to 11 in which the tearing strip is connected to the container by heat sealing, ultra sound sealing or friction sealing.
15. A closure as claimed in claims 13 in which the connecting pad is connected to the
15 container by heat sealing, ultra sound sealing or friction sealing.
16. A container associated with a closure as claimed in any one of the preceding claims.
17. A container as claimed in claim 16 whenever containing liquids such as
lubricating oils especially automotive lubricating oils, for example hydrocarbon or
20 synthetic lubricating oils.
18. A container as claimed in claim 16 whenever containing liquids such as fuel additives, anti-freeze compositions, brake fluids and the like.