

Tamper Evident Closure

The invention relates to tamper evident closure for a tube, container or package.

Tamper evident closures of various types have been known for a long time. Known tamper evident closures may comprise a tamper evident ring. Tamper evident closures with tamper evident rings
5 are used for bottles and other containers with closures which generally have a diameter not exceeding 5 to 6 cm like bottles or tubes for tablets. For example EP 0 202 506 B1 discloses a container with a closure comprising a tamper evident ring.

Tamper evident closures known in the state of the art may alternatively comprise a tamper evident tab, which is on one side of the closure connected by tear-off/tamper evident webs to the lid and
10 the body of a tube, container or package and has to be removed before opening the closure. Tamper evident tabs are often used for cup-like packages made of plastics with a lid and which have a large diameter (more than 5 to 6 cm) compared to i.e. the closures of bottles. It is also known to use tamper evident tabs with tubes as disclosed in FR 2707958 and JP 2004175436. Tamper evident tabs have the advantages first that it is more obvious for the consumer to recognize
15 if the tamper evident closure has been broken or manipulated than with the tamper evident ring, second that it is easier to peel off a tab than to break a ring.

The state of the art devices have either a tamper evident ring or a tamper evident tab. If a tamper evident tab has been removed it is not clear, if the tube, container or package really has been opened. The consumer might discard unnecessarily a tube, container or package, because the tab
20 had been removed for some reason, although the tube, container or package had in fact not been opened. On the other hand the consumer might not become aware that the tube, container or package had been opened if it has a tamper evident ring.

A disadvantage of tamper evident rings is also that in the state-of-the-art devices the tamper evident ring falls down when the tear-off/tamper evident webs connecting the ring to the closure
25 are broken.

The problem to be solved is therefore to provide a closure which alerts the consumer that the tube, container or package had been manipulated but preserves the consumer from unnecessarily discarding tubes, containers or packages, which have in fact not been opened.

This problem is solved by a closure for a tube, container or package with a ring connected to the
30 tube and a lid, which is attached to the ring by means of a hinge, of a tab and of tear-off/tamper evident webs between said ring and said lid. The tab is attached through tear-off/tamper evident webs to the ring and the lid.

Before the tube is opened the first time the tamper evident ring and the tab are connected with the lid by means of the tear-off/tamper evident webs and by a hinge. To open the tube for the first time, it is first necessary to remove the tab, which breaks the tear-off/tamper evident webs between the tab and the ring respectively the lid. A large "window" becomes accessible where the tab had been removed. The consumer can put his thumb into this window to push-up the lid. By doing this, the tear-off/tamper evident webs between the ring and the lid are also broken. The hinge is left as connection between lid and ring and prevents the ring from falling down. In an alternative embodiment the ring can be designed such that an inside part of the ring is adjusted to the tube, container or package such that it would be prevented from falling down even in the absence of a hinge.

Preferably the tear-off/tamper evident webs are located at predetermined distances, more preferred equidistant from one another. In an alternative embodiment in order to decrease or adjust the force for opening the first time the tear-off/tamper evident webs are arranged such that the more these tear-off/tamper evident webs are near to the tab, the more space there is between two of them.

In one embodiment the tab is located opposite to the hinge on the periphery of the closure. Preferably the tab does not extend beyond the external diameter of the ring, in order to assure a better efficiency on packing lines. The tab can have a width in the range from 8 to 40 mm, preferably in the range from 15 to 25 mm, and a height in the range of 2 to 20 mm, preferably in the range from 7 to 13 mm. A pictogram or a wording may be applied to the tab, indicating to the user that the tab has to be removed before opening the lid and which side of the tab to pull first.

The closure can be circular or ellipsoid. Preferably it has a height in the range from 10 to 40 mm, preferably 15 to 30 mm and a total diameter in the range from 10 to 50 mm, preferably in the range from 20 to 40 mm. The lid can contain a desiccant in a specific cavity or it can contain an attached canister with some desiccant and/or active materials in.

In one embodiment gripping parts are on the top of the lid. By means of the gripping parts the lid can be closed by pushing on the top of the closure with the index or with the thumb.

The closure is preferably of the snap-on type.

The closures according to the present invention can preferably be used on plastic or aluminium rigid tubes. If the closure is made of polymer material, then it can be fabricated by injection molding.

Also disclosed herewith is a method for opening a closure according to the present invention for the first time. Which method comprises the steps of removing the tab from the ring area such that a

window and a lid underside appear. By applying a force onto the underside of the lid i.e. by putting the thumb into the window, the user breaks the tear-off webs between the lid and the ring and thereby opens the closure. When opening the closure the next times the user uses the same procedure without the step of removing the tab.

- 5 For closing the closure the user grabs the tube, container or package with the closure and pushes on the top of the closure with the index or with the thumb and lets the lid snap onto the ring.

Figures and Examples

Fig. 1 shows a closure before the first opening

Fig. 2 shows a closure in open state

Fig. 3 shows a closure in closed state with tab removed

5 Fig. 1 shows a closure 1 before the first opening. The closure 1 comprises a lid 2, a tamper evident ring 3 and a tab 4. The tamper evident ring 3 and the tab 4 are connected with the lid 2 by means of the tear-off webs 7a, 7b and by a hinge 8 (shown in Fig. 2). An arrow 5 on the tab 4 is indicating for the user, that the tab 4 has to be removed before opening. In the example shown in Fig. 1 the closure (1) has a height of 22.5 mm and a diameter of 34.5 mm. The tab (4) has a width of 20 mm
10 and a height of 10 mm.

Fig. 2 shows a closure 1 in open state. The tab 4 has been removed. One part of the periphery of the tab 4 was connected through tear-off webs (not shown) with the ring 3 and the other part of the periphery of the tab 4 was connected through tear-off webs 7a to the lid 2. The tear-off webs 7a between the tab 4 and the ring 3 respectively the lid 2 have been broken. Tear-off webs 7b between
15 ring 3 and lid 2 have been broken, which were present at those parts of the periphery of the ring 3 and the lid 2, where no hinge 8 and no tear-off webs 7a are present.

Fig. 3 shows a closure 1 in closed state with tab 4 removed. A large window 9 is accessible where the tab 4 has been removed. The closure 1 can be opened by the user with only one hand by putting the thumb into the window 9 to push-up the lid 2. The lid 2 can be closed again by means
20 of the gripping parts 6 by pushing on the top of the lid 2 with the index or with the thumb.

Claims

1. Closure (1) for tube, container or package comprising:

a ring (3) connected to the tube, container or package; and

a lid (2), which is connected to the ring (3) by means of a

5 - a tab (4), wherein said tab (4) is connected through tear-off/tamper evident webs
 (7a) with the ring (3) and the lid (2), and

 - tear-off/tamper evident webs (7b) between said ring (3) and said lid (2).
2. Closure (1) according to claim 1, wherein the lid (2) is also connected to the ring (3) by
means of a hinge (8).
- 10 3. Closure (1) according to claim 1 or 2, wherein the ring is designed such that an inside part
of the ring is adjusted to the tube, container or package such that it would prevent the ring
from falling down after the tear-off/tamper evident webs (7a, 7b) have been broken.
4. Closure (1) according to one of the claims 1 to 3, wherein one part of the periphery of said
tab (4) is connected through tear-off/tamper evident webs (7a) with the ring (3) and the
15 other part of the periphery of said tab (4) is connected through tear-off/tamper evident
webs (7b) to the lid (2).
5. Closure (1) according to one of the claims 1 to 4, wherein the tear-off/tamper evident webs
(7b) between said ring (3) and said lid (2) are present at those parts of the periphery of the
ring (3) and the lid (2), where no tear-off/tamper evident webs (7a) to the tab (4) and, as
20 the case may be, no hinge (8) are present.
6. Closure (1) according to one of the claims 1 to 5, wherein the tear-off/tamper evident webs
(7a, 7b) are located at predetermined distances from one another.
7. Closure (1) according to claim 6, wherein the tear-off/tamper evident webs (7a, 7b) are
located equidistant to one another.
- 25 8. Closure (1) according to claim 6, wherein the tear-off/tamper evident webs (7a, 7b) are
arranged such that the more these tear-off/tamper evident webs (7a, 7b) are near to the tab
(4), the more space there is between two of them.

9. Closure (1) according to one of the claims 1 to 8, wherein the closure (1) is circular or ellipsoid.
10. Closure (1) according to claim 2, wherein the tab (4) is located opposite to the hinge (8) on the periphery of the closure (1).
- 5 11. Closure (1) according to one of the claims 1 to 10, wherein the tab (4) does not extend beyond the external diameter of the ring (3).
12. Closure (1) according to one of the claims 1 to 11, wherein the lid (2) contains a desiccant.
13. Closure (1) according to one of the claims 1 to 12, wherein the closure (1) has a height in the range from 10 to 40 mm, preferably in the range from 15 to 30 mm.
- 10 14. Closure (1) according to one of the claims 1 to 13, wherein the closure (1) has a diameter in the range from 10 to 50 mm, preferably in the range from 20 to 40 mm.
15. Closure (1) according to one of the claims 1 to 14, wherein the tab (4) has a width in the range from 8 to 40 mm, preferably in the range from 15 to 25 mm.
- 15 16. Closure (1) according to one of the claims 1 to 15, wherein the tab (4) has a height in the range from 2 to 20 mm, preferably in the range from 7 to 13 mm.
17. Closure (1) according to one of the claims 1 to 16, wherein the closure (1) is of snap-on type.
18. Closure (1) according to one of the claims 1 to 17, wherein the lid (2) has gripping parts (6) on its top side.
- 20 19. Closure (1) according to one of the claims 1 to 18, wherein the lid (2) has company logo and/or brand name and/or brand logo on its top side.
20. Closure (1) according to one of the claims 1 to 19, wherein the closure (1) is made of polymer material and fabricated by injection molding.
21. Closure (1) according to one of the claims 1 to 20, wherein a pictogram (5) or a wording is
25 applied to the tab (4), indicating to the user that the tab (4) has to be removed before opening the lid (2) and which side to pull this tab first
22. A method for opening a closure (1) of claim 1 for the first time, comprising the steps of
 - removing tab (4) such that a window (9) and a lid underside appear;

- applying a force onto the underside of the lid (2) thereby breaking the tear-off/tamper evident webs (7b) between the lid (2) and the ring (3); and
- opening the closure (1).

23. A method for opening a closure (1) of claim 1 comprising the steps of

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- putting a thumb into the window (9) in the ring (3) area of the closure (1);
 - applying a force onto the underside of the lid (2) thereby breaking the tear-off/tamper evident webs (7b) between the lid (2) and the ring (3); and
 - opening the closure (1).

24. A method of claim 22 or 23, wherein the force is applied to the underside of the lid (2) by
10 putting a thumb into the window (9) in the ring (3) area of the closure (1).

25. A method for closing the closure (1) of claim 1, comprising the steps of

- grabbing a tube, container or package with the closure (1);
- pushing on the top of the closure (1) with the index or with the thumb; and
- let the lid (2) snap onto the ring (3).