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(54) **TAMPER-EVIDENT CLOSURE**

ORIGINALITÄTSVERSCHLUSS

FERMETURE INVIOLABLE

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WO-A1-2006/117505 **GB-A- 2 450 939**

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Description

[0001] The present invention relates generally to a closure for a container and particularly to a closure with means for indicating that a closure has been opened at least once.

[0002] There is an increasing demand for tamper-indicating systems which ensure that a container is not refilled with non-original contents. Whilst it is relatively easy to produce some form of tamper-evidence it is much more difficult to provide tamper-evidence which cannot be either overcome without causing the tamper-evidence system to activate, or activate and then return to a virtually visually identical state so as to appear non-activated.

[0003] A particularly useful method of providing tamper-evidence is to use a system in which a closure is initially located in a first-position, but once removed can only be returned to a second position which is visually distinct from the first.

[0004] US 5,738,231 describes a closure with a part which is moved during the opening process so that following opening it cannot pass back over projection on a container finish. The result is that the closure can only return to position which is axially displaced with respect to its original position.

[0005] WO 02/096771 describes a closure in which two parts are initially adjacent each other and during the opening process the structure of the closure is changed so that a gap is generated between the two parts as a visual indication that the closure has been opened at least once.

[0006] WO 2005/049443 and WO 2006/117505 also describe closures in accordance with the preamble of appended claim 1 which generate a gap to indicate they have been opened at least once. In this case the gap is unobstructed. In other words, two parts of the closure are held apart without the requirement an obstruction.

[0007] Such tamper-evident systems are only effective if they cannot be reversed. For example, in systems which use an obstructing member to hold two parts apart it is possible to cut the obstruction member to allow a gap to be closed. WO 2005/049443 and WO 2006/117505 describe closures which generate unobstructed gaps following relative rotation of one part with respect to another. The closures are provided with some internal mechanism for preventing the two parts from being rotated back to their original relative positions. For example, ratchet arrangements present on the side walls of the parts can be used to prevent unwanted rotation. Such "lateral" ratchet arrangements have been found to be defeatable if sufficient reverse turning torque is applied.

[0008] There is a need for an increased level of resistance to defeating the tamper-evidence provided by such gap-generating closures by reverse turning before and/or after the gap is generated so as to prevent formation of the gap and/or to close the gap.

[0009] According to the present invention there is provided a tamper-evident closure for a container, the closure comprising: a first portion including inner and outer parts; and a second portion; the outer part is rotatable relative to the inner part from a first position in which at least part of the first and second portions are adjacent each other to a second position in which there is a gap therebetween, the first portion comprises locking means for irreversibly locking the closure in the second position upon first opening so that the gap cannot be closed, in which the inner part includes a line of weakness which breaks if the outer part is reverse rotated relative to the inner part.

[0010] The line of weakness may consist of a plurality of frangible bridges.

[0011] The line of weakness may transversely split the inner part.

[0012] The inner part and/or outer part may include a top plate and part of the locking means may be carried on or by the plate/s.

[0013] The locking means may comprise or include a ratchet arrangement.

[0014] In one embodiment both the inner and outer parts have respective top plates which include corresponding ratchet parts that engage to prevent relative rotation of the parts. This type of ratchet arrangement may be referred to as a longitudinal ratchet arrangement, as opposed to known lateral arrangements which are positioned on side walls.

The second portion may be adapted to be connected to a container and the first portion may comprise a cap. Certain industries demand closures with a first potion comprising a cap and a second portion comprising a sleeve which is connected to a container; for example the spirits industry.

[0015] The closure may further comprise a fitment such as a non-return fitment. Alternatively the first portion may be adapted to engage a fitment associated with the container. Certain industries, in particular the spirits industry, demand additional measures to prevent tampering. In-bore fitments, such as non-return fitments, are often fitted to containers to prevent re-filling regardless of other tamper-proofing measures.

[0016] The closure may include means for preventing the inner part from moving relative to the second portion until it has reached the second position.

[0017] The gap may be unobstructed. This means that the closure would not have to rely on an obstructing member becoming trapped. By forming an unobstructed gap it is not possible to defeat the tamper-evidence by a simple cutting operation. The gap may be formed at the respective adjacent peripheries of the portions. The inner part may include a section which extends beyond the outer part towards the second portion in the second position; the part may be positioned so as to be visible through the gap.

[0018] The second portion may be permanently fixed in its position on the container. This can be used to prevent the second portion from being moved to close the gap.

[0019] The first portion may further include a lateral ratchet arrangement for locking the inner and outer parts in the second position. This provides increased resistance to re-setting.

[0020] The first portion may include engagement formations and the lateral ratchet arrangement is located above the formations. The first portion may include formations, such as screw threads, for engaging the container or in-bore fitment. In such cases the ratchet arrangement or other locking mechanism may be located above the formations so as to increase the difficulty in accessing and tampering with the locking arrangement. The present invention will now be more particularly described, by way of example with reference to the accompanying drawings, in which:

Figure 1 is a section of a closure formed according to the present invention in a first, unopened position and shown attached to a container neck;
Figure 2 is a side elevation of the closure of Figure 1 shown prior to attachment to a container neck;
Figure 3 shows the closure of Figure 1 after a first opening stage;
Figure 4 shows the closure of Figure 2 after a first opening stage:
Figure 5 shows the closure of Figure 4 after a second opening stage;
Figure 6 shows the closure of Figure 5 after a top cap has been re-fitted;
Figure 7 shows the closure of Figure 1 following an attempt at reverse opening: and
Figure 8 is a perspective view of the closure of Figure 7.

[0021] Referring first to Figures 1 and 2 there is shown a closure generally indicated 10. In Figure 1 the closure 10 is shown secured onto a container neck 15. The structure and arrangement is similar to that described in WO2009/010722.

[0022] The closure 10 comprises a main pourer body 20, an inner part 25 and an outer part 30. A metal shell 35 forms an outer casing to the closure and is divided into a cylindrical lower part 36 and a cup-shape second part 37. The parts 36, 37 are separated at a split line 40 formed by a cutting process once the shell 35 has been applied to the first and second portions of the closure.

[0023] Together the body 20 and the shell part 36 comprise a second portion and the inner and outer parts plus the shell part 37 comprises a cap-like first portion.

[0024] In this embodiment the upper and lower shell parts 36, 37 are initially joined along the split line 40 by a plurality of frangible bridges which will break if either: i) the lower shell part 36 is rotated before initial opening; or ii) an attempt is made to pull the top part of the closure off without unscrewing.

[0025] The inner part 25 of the closure extends beyond the split line 40 and the open end of the outer part to provide a dog-leg shape terminal portion 90 which rests on a shoulder 20a on the main body 20 so that one half 92 of the terminal portion fits beneath the upper end of the lower shell part 36 and the other half 94 fits in the upper shell part 37. Above the shell split line 40 a plurality of frangible bridges (not shown) are formed in the inner part 25 to form a split line 85.

[0026] The inner port 25 also has a line of weakness 26 provided approximately half way along its side skirt formed by a plurality of frangible bridges 27. This divides the part into a first portion 28 and a second portion 29.

[0027] The main body 20 is fixed onto the container neck 15 by clips 45 which project inwardly and engage under a shoulder 50.

[0028] A valve housing 55 is clipped into the main body 20 and includes a sealing lip 57 which seals against the top surface 16 of the container neck 15.

[0029] A float valve 65 is housed in the housing 55 and can seal against a valve seat 60 to prevent re-filling of the container. A valve control ball 70 is located on top of the float valve 65.

[0030] In normal operation the second part 37 of the shell 35 is rotated anti-clockwise and the unscrewing action breaks the bridges on the split line 40.

[0031] The outer part unscrews together with the second part 37 whilst the inner part remains held on the main body. The unscrewing continues to the position shown in Figures 3 and 4 until a ratchet locking mechanism locks the outer part to the inner part 25.

[0032] With the outer and inner parts locked together the inner part 25 can then be unscrewed from the main body 20. Because the terminal portion 92 is held under the shell part 36, when the inner part rotates it breaks along the split line 85. The result is that the terminal portion 90 of the inner part remains held on the body so that the half 94 produces a visible upstanding band as shown in Figure 5.

[0033] When the cap (shell part 37, outer part 30, inner part 25) is screwed back onto the main body 20, a gap G is formed between the first and second shell parts 36, 37. This is because the outer part 30 cannot be screwed completely back down onto the inner part 25 by virtue of the locking mechanism. In addition, the band 94 of the inner part 25 projects above the shell part 36 so as to be visible in the gap G as shown in Figure 6.

[0034] The gap G formed between the shell parts 36, 37 is unobstructed in the sense that there is no obstruction member trapped between the parts 36, 37.

[0035] In Figures 7 and 8 the closure of Figures 1 and 2 is shown following an attempt to overcome the tamper evidence by reverse opening.

[0036] If the shell part 37 is rotated clockwise the inner part first portion 28 is caused to rotate relative the second portion 29, which causes the bridges 27 to break. The inner part 25 splits along the line 26 and the shell part can be removed with the outer part and the inner part first portion. In other words, if the closure is deliberately (or accidentally) rotated in the direction opposition to that required for normal operation, in which the gap is gener-

ated, then the inner part is caused to break so that thereafter normal operation of the closure is not possible.

[0037] There are no internal screw threads on the first portion 28 so the top cap cannot be screwed back on the main body 20.

[0038] The break will occur if reverse opening is attempted (deliberately or accidentally) either before or after the gap is generated.

Claims

1. A tamper-evidentclosure (10) for a container, the closure (10) comprising:

   - a first portion (25, 30, 37) including inner and outer parts (25, 30); and
   - a se c o nd p o rtio n (20, 36);

   the outer part (30) is rotatable relative to the inner part (25) from a first position in which at least part of the first and second portions (2, 5, 30, 37, 20, 36) are adjacent each other to a second position in which there is a gap (G) therebetween, the first portion (25, 30, 37) comprises locking means for irreversibly locking the closure (10) in the second position upon first opening so that the gap (G) cannot be closed, **characterized in that** the inner part (25) includes a line of weakness (26) which breaks if the outer part (30) is reverse rotated re la tive to the inner part (25).

2. A tamper-evident closure (10) as claimed in Claim 1, in which the inner part (25) and/or outer part (30) includes a top plate and part of the locking means is carried on or by the plate/s.

3. A tamper-evident closure (10) as claimed in Claim 1 or claim 2, in which the locking means comprise a longitudinal ratchet arrangement.

4. A tamper-evident closure (10) as claimed in any of Claims 1 to 3, in which the second portion (20, 36) is adapted to be connected to a container and the first portion (25, 30, 37) comprises a cap.

5. A tamper-evident closure (10) as claimed in any preceding claim, in which the c lo sure (10) further comprises a no n-re turn fitme nt.

6. A tamper-evident closure according to any of Claims 1 to 4, in which the first portion (25, 30, 37) is adapted to engage an in-bore fitment associated with the container. r.

7. A tamper-evident closure (10) as claimed in any preceding claim, in which the closure (10) includes means for preventing the inner part (25) from moving relative to the second portion (20, 36) until it has reached the second position.

8. A tamper-evident closure (10) as claimed in any preceding claim, in which the gap (G) is unobstructed.

9. A tamper-evident closure according to any preceding claim, in which the first portion (25, 30, 37) further includes a lateral ratchet arrangement for locking the inner and outer parts (25, 30) in the second position.

10. A tamper-evident closure (10) according to Claim 9, in which the first portion (25, 30, 37) includes engagement formations and the ratchet arrangement is located above the formations.

11. A tamper-evident closure (10) according to any preceding claim, in which the gap (G) is formed at the respective adjacent peripheries of the portions.

12. A tamper-evident closure (10) according to any preceding claim, in which the inner part (25) includes a part which extends beyond the outer part (30) towards the second portion (20, 36) in the second position, the part is positioned so as to be visible through the gap (G).

13. A tamper-evident closure (10) asclaimed in any preceding claim, in which the closure (10) includes a metal shell (35) that is associated with the first and second portions (25, 30, 37, 20, 36) and in which the gap (G) is formed within the shell (35).

14. A tamper-evident closure (10) as claimed in any preceding claim, in which the line of weakness (26) transverse lydividesthe inner part (25).

15. A tamper-evident closure (10) as claimed in any preceding claim, in combination with a container.

Patentansprüche

1. Originalitätsverschluss (10) für einen Behälter, wobei der Verschluss (10) umfasst:

   - einen ersten Bereich (25, 30, 37), der innere und äußere Teile (25, 30) enthält,
   - und einen zweiten Bereich (20, 36),

   wobei der äußere Teil (30) relativ zu dem inneren Teil (25) von einer ersten Position, in der zumindest Teile der ersten und zweiten Bereiche (25, 30, 37, 20, 36) einander benachbart sind, in eine zweite Position drehbar ist, wobei dazwischen ein Spalt (G) vorhanden ist,
   wobei der erste Bereich (25, 30, 37) eine Verriegelungseinrichtung zum irreversiblen Verriegeln des Verschlusses (10) in der zweiten Position auf ein ers-

tes Öffnen hin umfasst, derart, dass der Spalt (G) nicht geschlossen werden kann,
dadurch gekennzeichnet, dass der innere Teil (25) eine Schwächungslinie (26) enthält, die zerbricht, falls der äußere Teil (30) relativ zu dem inneren Teil (25) zurückgedreht wird.

2. Originalitätsverschluss (10) nach Anspruch 1, wobei der innere Teil (25) und/oder der äußere Teil (30) eine Deckplatte enthalten und ein Teil der Verriegelungseinrichtung auf oder von der/den Platte(n) getragen wird.

3. Originalitätsverschluss (10) nach Anspruch 1 oder 2, wobei die Verriegelungseinrichtung eine längs verlaufende Ratschenanordnung umfasst.

4. Originalitätsverschluss (10) nach einem der Ansprüche 1 bis 3, wobei der zweite Bereich (20, 36) dazu geeignet ist, mit einem Behälter verbunden zu werden, und der erste Bereich (25, 30, 37) eine Kappe umfasst.

5. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der Verschluss (10) ferner eine Rückdrehsperreinrichtung umfasst.

6. Originalitätsverschluss (10) nach einem der Ansprüche 1 bis 4, wobei der erste Bereich (25, 30, 37) dazu geeignet ist, in eine dem Behälter zugehörige Bohrlocheinrichtung einzugreifen.

7. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der Verschluss (10) Mittel enthält, die verhindern, dass der innere Teil (25) sich relativ zu dem zweiten Bereich (20, 36) bewegt, bis er die zweite Position erreicht hat.

8. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der Spalt (G) unverspemt ist.

9. Originalitätsverschluss nach irgendeinem vorhergehenden Anspruch, wobei der erste Bereich (25, 30, 37) ferner eine seitliche Ratschenanordnung zum Verriegeln der inneren und äußeren Teile (25, 30) in der zweiten Position enthält.

10. Originalitätsverschluss (10) nach Anspruch 9, wobei der erste Bereich (25, 30, 37) Eingreifeinrichtungen enthält und die Ratschenanordnung sich oberhalb der Einrichtungen befindet.

11. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der Spalt (G) an den jeweiligen benachbarten Umfängen der Bereiche gebildet ist.

12. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der innere Teil (25) einen Teil enthält, der sich über den äußeren Teil (30) zu dem zweiten Bereich (20, 36) in der zweiten Position erstreckt, wobei der Teil derart positioniert ist, um durch den Spalt (G) sichtbar zu sein.

13. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei der Verschluss (10) eine Metallhülse (35) enthält, die den ersten und zweiten Bereichen (25, 30, 37, 20, 36) zugeordnet ist, und wobei der Spalt (G) in der Hülse (35) gebildet ist.

14. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch, wobei die Schwächungslinie (26) den inneren Teil (25) quer teilt.

15. Originalitätsverschluss (10) nach irgendeinem vorhergehenden Anspruch in Kombination mit einem Behälter.

Revendications

1. Fermeture inviolable (10) pour un récipient, la fermeture (10) comprenant:

- une première partie (25, 30, 37) incluant des pièces intérieure et extérieure (25, 30), et
- une deuxième partie (20, 36),

la pièce extérieure (30) peut tourner par rapport à la pièce intérieure (25) à partir d'une première position dans laquelle au moins une partie des première et deuxième parties (25, 30, 37, 20, 36) sont chacune adjacentes l'une par rapport à l'autre jusqu'à une deuxième position dans laquelle il existe un espace (G) entre elles, la première partie (25, 30, 37) comprend un moyen de blocage destiné à bloquer de manière irréversible la fermeture (10) dans la deuxième position lors d'une première ouverture de sorte que l'espace (G) ne puisse pas être fermé, **caractérisé en ce que** la pièce intérieure (25) inclut une ligne de faiblesse (26) qui se rompt si la pièce extérieure (30) est amenée à tourner en sens inverse par rapport à la pièce intérieure (25).

2. Fermeture inviolable (10) selon la revendication 1, dans laquelle la pièce intérieure (25) et/ou la pièce extérieure (30) inclut une plaque supérieure et une partie du moyen de blocage est supportée sur ou par la ou les plaques.

3. Fermeture inviolable (10) selon la revendication 1 ou la revendication 2, dans laquelle le moyen de blocage comprend un agencement de cliquet longitudinal.

4. Fermeture inviolable (10) selon l'une quelconque des revendications 1 à 3, dans laquelle la deuxième partie (20, 36) est destinée à être connectée à un récipient et la première partie (25, 30, 37) comprend un bouchon.

5. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle la fermeture (10) comprend en outre une configuration antiretour.

6. Fermeture inviolable (10) selon l'une quelconque des revendications 1 à 4, dans laquelle la première partie (25, 30, 37) est destinée à s'engager avec une configuration dans l'embouchure avec le récipient.

7. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, où la fermeture (10) inclut un moyen pour empêcher la pièce intérieure (25) de se déplacer par rapport à la deuxième partie (20, 36) jusqu'à ce qu'elle ait atteint la deuxième position.

8. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle l'espace (G) n'est pas obstrué.

9. Fermeture inviolable selon l'une quelconque des revendications précédentes, dans laquelle la première partie (25, 30, 37) inclut en outre un agencement de cliquet latéral pour un blocage des pièces intérieure et extérieure (25, 30) dans la deuxième position.

10. Fermeture inviolable (10) selon la revendication 9, dans laquelle la première partie (25, 30, 37) inclut des formations d'engagement et l'agencement de cliquet est situé au-dessus des formations.

11. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle l'espace (G) est formé au niveau des périphéries adjacentes respectives des parties.

12. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle la pièce intérieure (25) inclut une partie qui s'étend au-delà de la pièce extérieure (30) en direction de la deuxième partie (20, 36) dans la deuxième position, la pièce est positionnée de manière à être visible à travers l'espace (G).

13. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle la fermeture (10) inclut une coquille métallique (35) qui est associée aux première et deuxième parties (25, 30, 37, 20, 36) et dans laquelle l'espace (G) est formé dans la coquille (35).

14. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, dans laquelle la ligne de faiblesse (26) divise de manière transversale la pièce intérieure (25).

15. Fermeture inviolable (10) selon l'une quelconque des revendications précédentes, en combinaison avec un récipient.

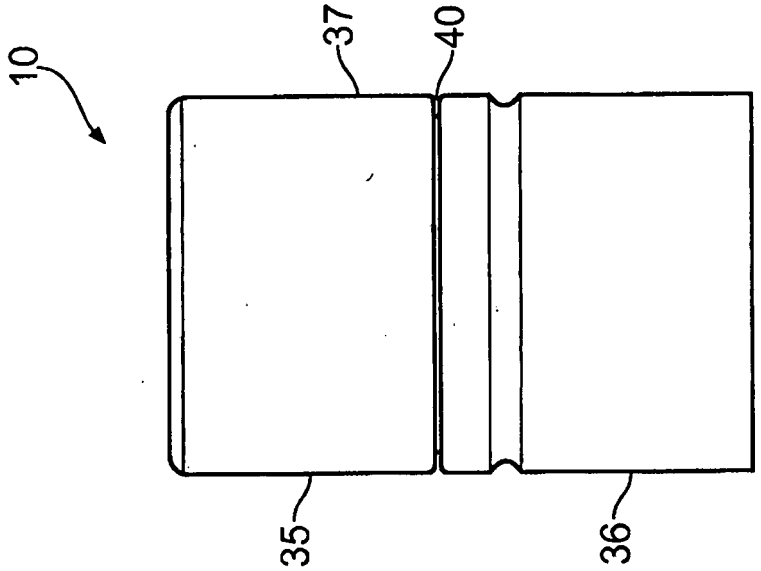
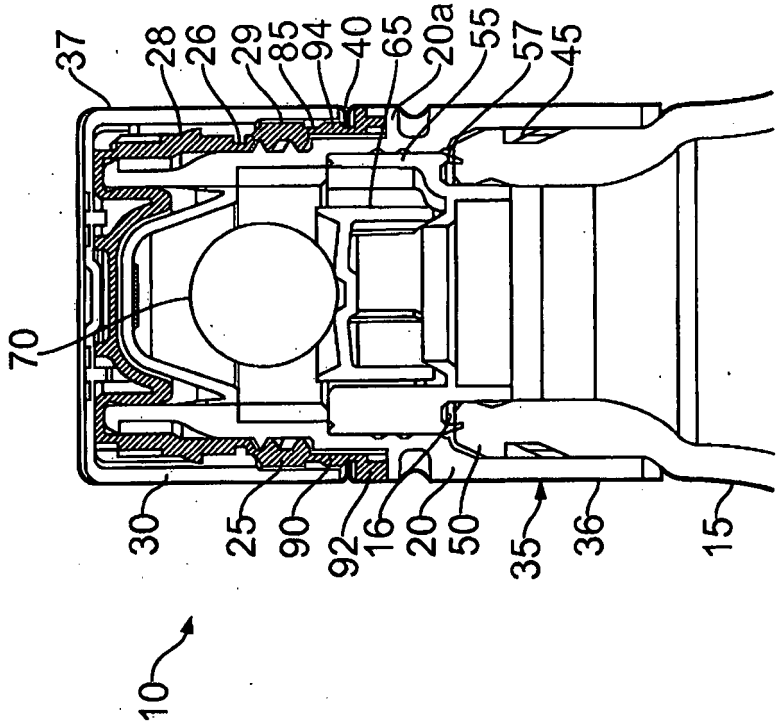

10
37
40
35
36

FIG. 2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94
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36
15
10

FIG. 1

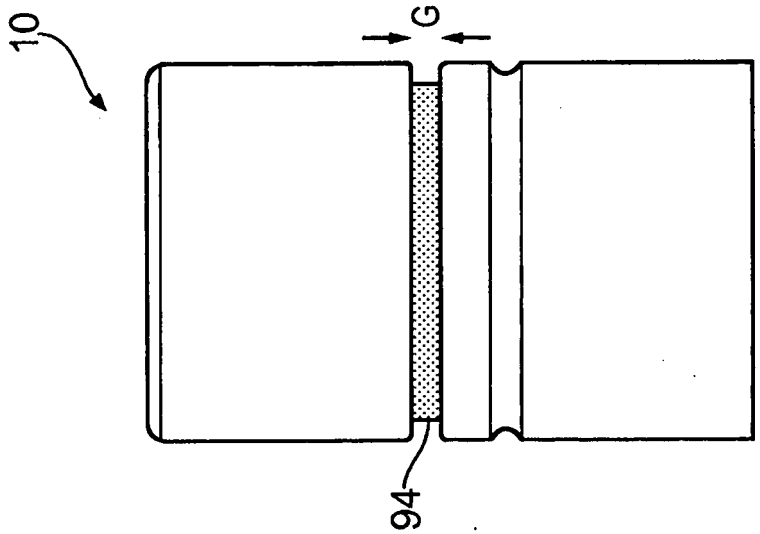

FIG. 4

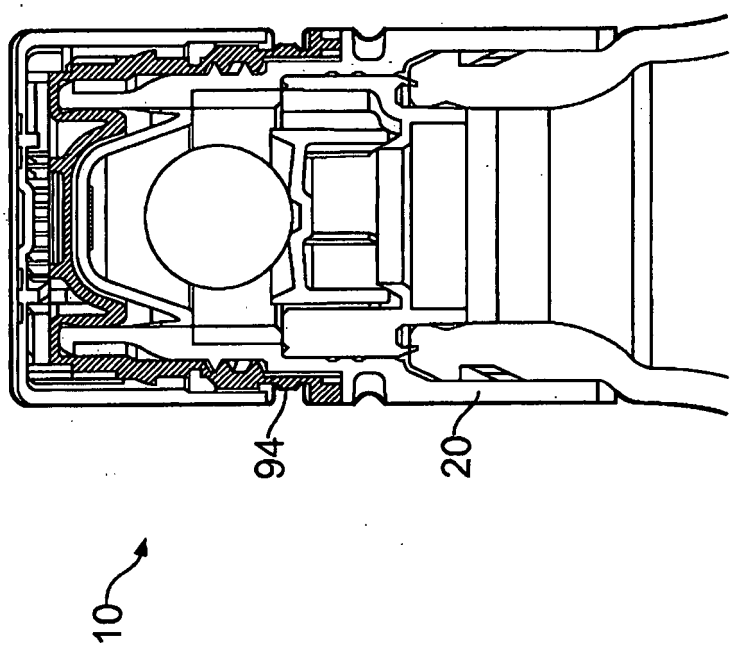

FIG. 3

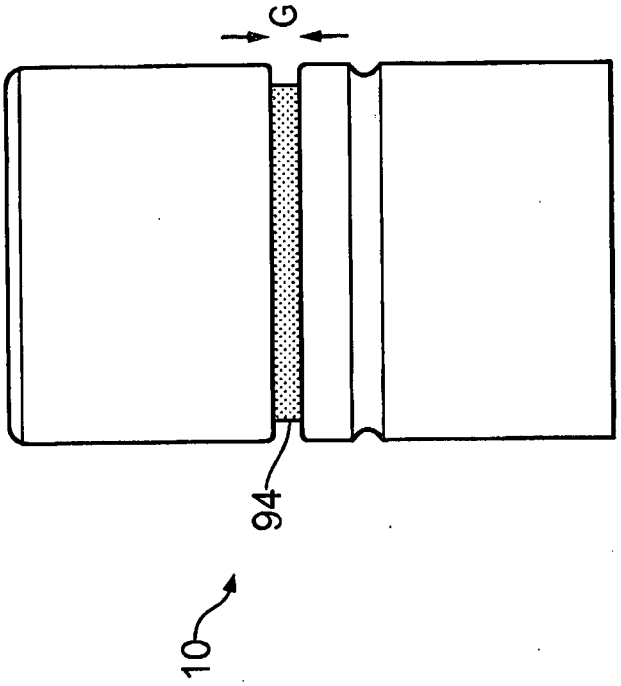

FIG. 6

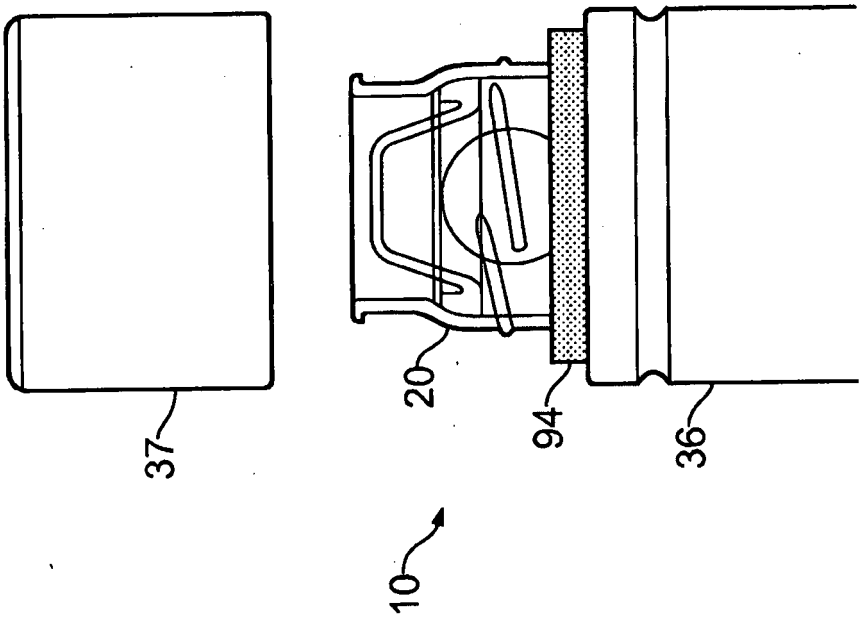

FIG. 5

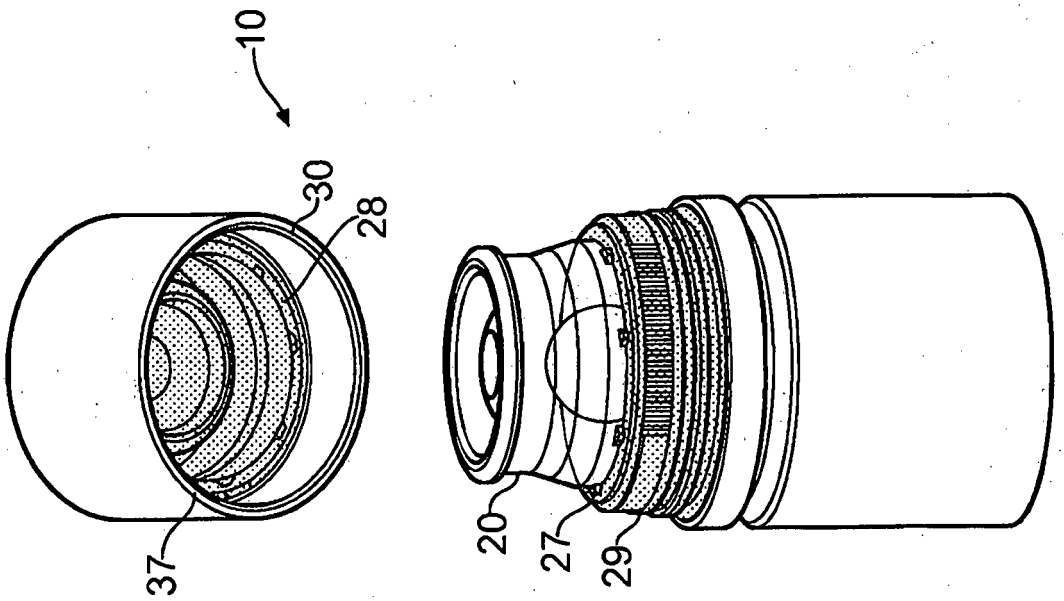

FIG. 8

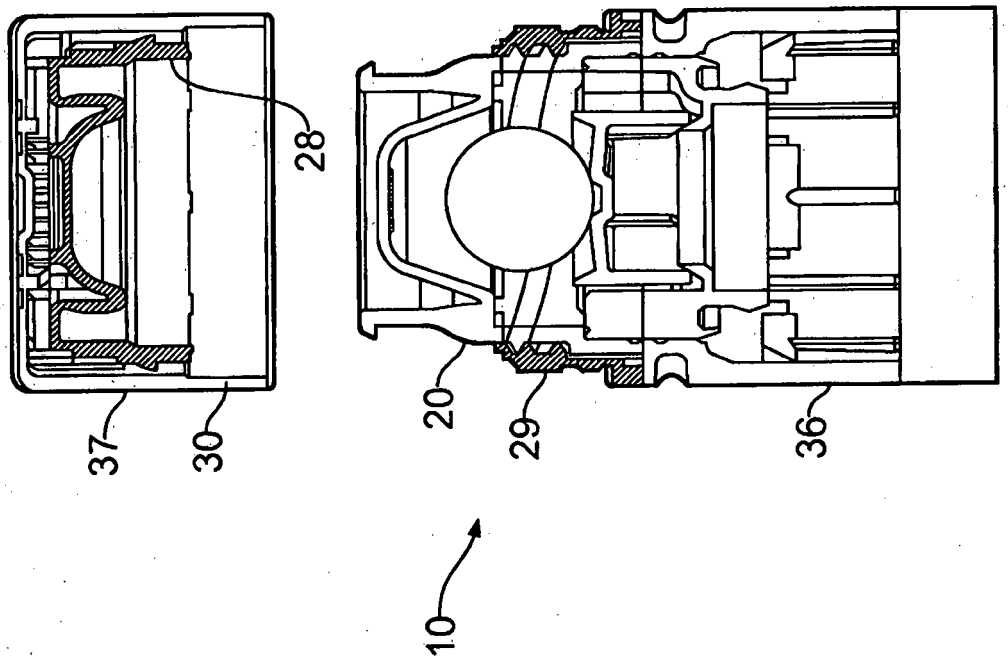

FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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