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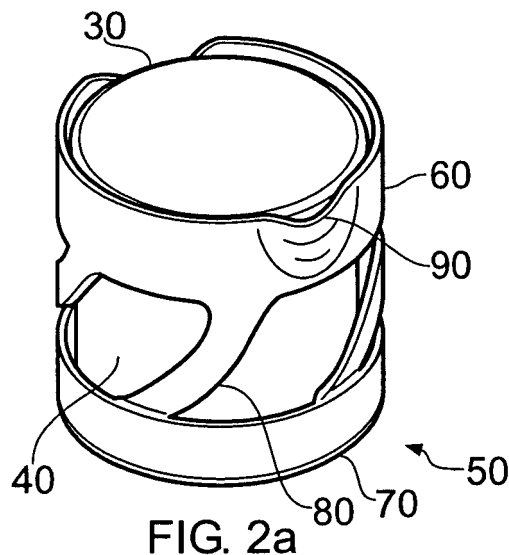
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(54) **A child-resistant closure system**

(57) A child-proofing device (50) is provided for a closure (10) having an opening area (40) which must be accessed to allow it to be opened. The device (50) includes a obstruction member (60) adapted to move from a first position in which, in use, it obstructs access to the

opening area to a second position in which it has moved sufficiently to allow access to the opening area. A child-proof closure (110) including a child-proofing device and a closure/container combination including child-proofing device are also provided.



Description

[0001] The present invention relates to a child-resistant closure system.

[0002] Child-resistance is becoming an increasingly desirable feature for closures. Many child-resistant systems use a catch, latch or the like which must be moved in an operation requiring, for example, a degree of manual and/or mental dexterity which is beyond the capacity of a child. However, in current child-resistant systems the area of the closure which must be accessed to allow the lid to be opened is freely accessible.

[0003] The present invention provides a child-proofing device for a closure having an opening area which must be accessed to allow it to be opened, the device including an obstruction member adapted to move from a first position in which, in use, it obstructs access to the opening area, to a second position in which it has moved sufficiently to allow access to the opening area.

[0004] The present invention is therefore based on the concept that the child is prevented from gaining access to that part of the closure which is used for opening.

[0005] The opening area which must be accessed to allow the closure to be opened may comprise, for example, the entire exterior or sidewall of the closure which might have knurling to aid gripping. Alternatively, the opening area could comprise a small part of a multi-component closure, such as one with a base and lid. In this case the opening area could comprise a finger recess or an overhang.

[0006] Once access to the opening area is gained the opening operation itself can be made relatively easy or could include further child-resistant features.

[0007] The device may be formed as an integral part of the closure or may be formed as a separate and removable component which could be used on different closures. By providing the obstruction member on a separate part the device can be made and sold separately and could be adapted to fit a range of closures.

[0008] Where the obstruction member is provided on a separate component, not forming an integral part of the closure the device must include some form of attachment means for attaching the part to the closure in such a way that child-resistance of the obstruction member cannot be by passed by simply removing the part. By providing the obstruction member on a separate component a closure can be retrofitted with a child-resistance feature.

[0009] The device may have a fixing portion which is arranged to hold the obstruction member in the first position. The obstruction member may be connected to the fixing portion by a resilient connection.

[0010] The present invention also provides a child-proof closure having an opening area which must be accessed to allow it to be opened, the closure further comprises a child-proofing device as defined herein, anchored to the closure and arranged such that its obstruction member obstructs access to the opening area.

[0011] The closure may have two parts adapted to

move relative to one another to effect opening of the closure. For example, the closure may comprise a base and a lid, and the obstruction member is adapted to prevent the lid from being opened. The base and the lid may be permanently connected to each other, for example by a hinge arrangement. By permanently connecting the base and the lid together at at least one point this can be used to restrict the potential opening area which then restricts the area of the closure which must be obstructed.

[0012] In one embodiment the opening area comprises an overhang portion on the lid.

[0013] The obstruction member must in some way be held in place with respect to the closure so that in its first position the obstruction member obstructs the opening area of the closure. For example, the device may be adapted to be secured to the closure.

[0014] The obstruction member may be resiliently biased towards the first position. An automatic return function is particularly advantageous for child-resistance so as to avoid not returning the obstruction member to the first position, as would be possible with a manual reset arrangement.

[0015] The resilient biasing may be provided by a spring arrangement or the like. The strength of the resilience against which the obstruction member must be moved can be tailored to suit different applications. The strength could be set above that which an average child could generate.

[0016] The closure may include a catch which must be released before the closure can be opened, and movement of the obstruction member is adapted to allow access to the opening area and also to release the catch.

[0017] The obstruction member may be formed on a first hoop which extends around the periphery of the closure. The first hoop may be joined to a second hoop adapted to extend around the base, the first and second hoops being connected by one or more spring members to provide resilient biasing of the obstruction member towards the first position.

[0018] The present invention also provides a closure/container combination comprising a closure having an opening area which must be accessed to allow it to be opened, a container adapted to connect with the closure, and a child-proofing device as defined herein, anchored to the container and arranged such that its obstruction member obstructs access to the opening area.

[0019] The device maybe formed integrally with the closure/container combination.

[0020] The present invention will now be more particularly described, by way of example, with reference to the accompanying drawings, in which:

Figure 1a is a perspective view of a closure formed as part of a first embodiment of the present invention; Figure 1b is a section of the closure of Figure 1a shown fitted to a container;

Figure 2a is a perspective view of the closure of Figure 1a fitted with a child-proofing device according

to the present invention shown in a first position;
 Figure 2b is a section view of the closure/device of
 Figure 2a shown fitted to a container;
 Figure 3a is a perspective view of the closure/device
 of Figure 2a with the child-proofing device in a sec-
 ond position;
 Figure 3b is a section view of the closure/device of
 Figure 3a shown fitted to a container;
 Figures 4a to 4c are, respectively, front, side and
 rear elevations of a closure forming part of a second
 aspect of the present invention;
 Figure 5 is a perspective view of the closure shown
 in Figures 4a to 4c fitted with a child-proofing device
 shown in a first position;
 Figure 6 is a perspective view of the closure of Figure
 5 shown with the device in a second position;
 Figure 7 is a perspective view of the closure of Figure
 6 with the closure lid opened;
 Figure 8a is a section of a closure/device according
 to an alternative embodiment with an obstruction
 member shown in a first position;
 Figure 8b is a section view of the closure/device of
 Figure 8a with the obstruction member shown in a
 second position;
 Figure 9 is a container formed according to a third
 aspect of the present invention;
 Figure 10a is a schematic perspective view of a clo-
 sure/device according to a further embodiment with
 an obstruction member shown in a first position;
 Figure 10b is a schematic perspective view of the
 closure/device of Figure 10a with the obstruction
 member shown in a second position;
 Figure 11 is a perspective view of a device formed
 according to an alternative embodiment shown in an
 obstruction position on a closure; and
 Figure 12 is a perspective view of the device of Figure
 12 shown following opening of the closure.

[0021] Referring first to Figure 1a and Figure 1b there
 is shown a closure generally indicated (10) attached to
 a container generally indicated (20) by screw thread en-
 gagement.

[0022] The closure (10) comprises a top panel (30) and
 a depending cylindrical sidewall (40). In order to open
 the closure the sidewall (40) is grasped and the closure
 is unscrewed.

[0023] Referring now to Figure 2a and Figure 2b there
 is shown the closure (10) fitted with a child-proofing de-
 vice generally indicated (50).

[0024] The device (50) comprises a first hoop (60)
 which fits around the top of the closure sidewall (40), and
 a second hoop (70) which fits around the open end of
 the closure sidewall (40). The hoops (60, 70) arc axially
 spaced and joined by a plurality of spring members in the
 form of cross-pieces (80).

[0025] The Lower end of the second hoop (70) is con-
 nected to the open end of the sidewall (40). In this em-
 bodiment the connection is provided by a bead (85) which

clips under the open end of the sidewall.

[0026] With the device (50) in place, access to the side-
 wall (40) is obstructed and cannot be accessed suffici-
 ently through the spaces between the cross-pieces (80) to
 turn the closure. The device does not fit tightly on the
 closure; accordingly turning of the device (50) does not
 turn the closure (10).

[0027] Referring to Figures 3a and 3b the first hoop
 (60) has been pressed down towards the second hoop
 (70) against the resilience of the cross-pieces (80). A
 finger recess (90) is provided in the first hoop (60) to help
 push the hoop (60) down. In other embodiments there is
 no recess, but rather a localised thickening of the hoop
 to assist in pushing the hoop down.

[0028] With the first hoop (60) in this second position
 an upper part (45) of the sidewall (40) can be grasped,
 which allows the closure (10) to be twisted open. When
 the first hoop (60) is released it automatically springs
 back to the position shown in Figure 2.

[0029] In order to allow the closure (10) to be replaced
 on the container (20) a ratchet arrangement (not shown)
 could be provided to allow the device to turn the closure
 in the direction of screwing but not unscrewing.

[0030] Figures 4a to 4c show a different type of closure
 (110). The closure comprises a base (111) and a lid (112).
 The base (111) and the lid (112) are connected to each
 other by a hinge (113) to form a flip-top closure. Diamet-
 rically opposite the hinge a depression (114) on the base
 sidewall creates an overhang (115) on the lid (112), which
 can be used to lift the lid (112).

[0031] Figure 5 shows the closure (110) fitted with a
 child-proofing device (150).

[0032] The first hoop (160) of the device (150) fits
 around the periphery of the lid (112), extending over the
 overhang (115) and down over the depression (114). Ac-
 cess to the overhang (115) is obstructed and so the lid
 (112) cannot be lifted.

[0033] When the hoop (160) is pressed down against
 the resilience of the cross-pieces (180) the overhang
 (115) is exposed as shown in Figure 6. The lid can now
 be lifted as shown in Figure 7.

[0034] Figure 8 is a side section of a snap-fit closure
 (210) shown fitted with a device (250) according to an
 alternative embodiment. The device (250) includes first
 (260) and second (270) hoops. In this embodiment the
 hoops (260, 270) are joined by a corrugated sleeve (265)
 which resiliently biases the first hoop (260) to a first up-
 ward position in which the base depression (214) and lid
 overhang (215) are obstructed.

[0035] The first hoop (260) can be pushed down
 against the resilience of the sleeve (265) to a second
 position shown in Figure 8b, in order to allow access to
 the overhang (215).

[0036] Figure 9 shows a device (350) similar to that of
 Figure 8a. In this embodiment, however, the device (350)
 is not attached to a closure (310). Instead the device is
 adapted to attach to the neck (321) of the container (320).
 The lower hoop (370) snaps over the neck transfer bead

(322).

[0037] To avoid the risk that a user might try to squeeze the sleeve (365) and apply pressure to a closure through it, the second hoop (370) and neck (321) arc provided with a plurality of co-operating projections (395, 396). The projections (395, 396) prevent the device (350) being turned relative to the neck (321). Thereby a closure (310) cannot be turned without first overcoming the obstruction presented by the first hoop (360) and the sleeve (365).

[0038] Figure 10a shows a closure (410) and device (450). The closure (410) is the same as that shown in Figures 4a to 4c and is adapted to be snap-fit engaged onto a container neck (not shown).

[0039] The device (450) comprises a rigid sleeve (465) anchored to the closure base (411) by a bead or the like (not shown). The connection is such that the sleeve (465) can be rotated relative to the closure (410).

[0040] The sleeve (465) is provided with a flap (466) which is resiliently biased to a first position, as shown in Figure 10a. The resilient biasing is achieved by the hinge line (467) along the lower edge of the flap where it joins the sleeve (465). In this position the closure overhang (415) cannot be accessed.

[0041] In order to lift the lid (412) the flap (466) must first be brought onto alignment with the overhang (415). For this purpose arrows (466a, 430a) are provided on the flap (466) and on the top panel (430) of the lid (412). The arrows (446a, 430a) must be aligned by revolving the sleeve (465) before the flap (466) is pulled down to the position shown in Figure 10b, whereupon the overhang (415) can be accessed.

[0042] This embodiment therefore includes a further level of child-resistance, that being the requirement for alignment of the arrows (466a, 430a).

[0043] Referring now to Figure 11 there is shown a device (550) shown fitted to a closure (510).

[0044] The device (550) comprises a second ring (570) which engages the closure (510) and a first ring (560) which is positioned to extend around the closure lid (512).

[0045] The rings (560, 570) are spaced by a plurality of inflection-curved filament-like spring elements (580). The elements (580) resiliently bias the ring (560) to the position shown in Figure 11 so that the closure depression (514) is obstructed.

[0046] The ring (560) can be pushed down towards the ring (570) to reveal the depression (514) and allow the lid (512) to be flipped open. The ring (560) can then return to its original position as shown in Figure 12.

Claims

1. A child-proofing device (50) for a closure (10) having an opening area (40) which must be accessed to allow it to be opened, the device (50) including an obstruction member (60) adapted to move from a first position in which, in use, it obstructs access to the opening area, to a second position in which it

has moved sufficiently to allow access to the opening area.

2. A device (50) according to Claim 1, wherein the device has a fixing portion (70) arranged to hold the obstruction member (60) in the first position.
3. A device (50) according to Claim 2, wherein the obstruction member (60) is connected to the fixing portion (70) by a resilient connection (80).
4. A device (50) according to any of Claims 1 to 3, wherein the obstruction member (60) is resiliently biased towards the first position.
5. A child-proof closure (110) having an opening area (115) which must be accessed to allow it to be opened, the closure (110) further comprises a child-proofing device (150) according to any preceding claim, anchored to the closure and arranged such that the obstruction member (160) obstructs access to the opening area.
6. A closure (110) according to Claim 5, wherein the closure has two parts (111, 112) adapted to move relative to one another to effect opening of the closure.
7. A closure (110) according to Claim 5 or Claim 6, wherein the closure further comprises a catch which is arranged to release in response to movement of the obstruction member (160) to the second position.
8. A device (50) or closure (110) according to any preceding claim, wherein the device is formed integrally with the closure.
9. A closure/container combination comprising:
 - a closure (310) having an opening area (340) which must be accessed to allow it to be opened;
 - a container (320) adapted to connect with the closure; and
 - a child-proofing device (350) according to any of Claims 1 to 4, anchored to the container and arranged such that the obstruction member (360, 365) obstructs access to the opening area.
10. A closure/container combination according to Claim 9, wherein the device (350) is formed integrally with the container (320).

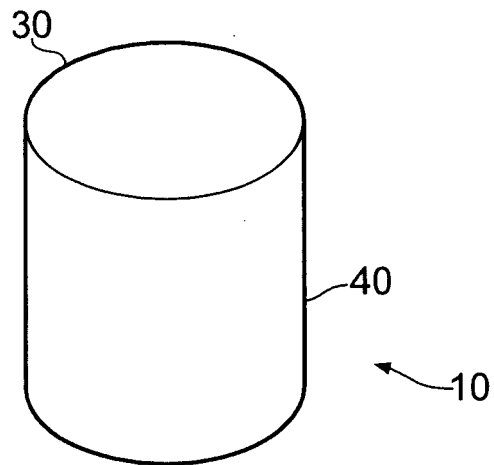


FIG. 1a

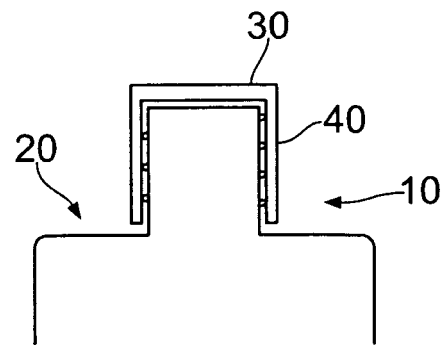


FIG. 1b

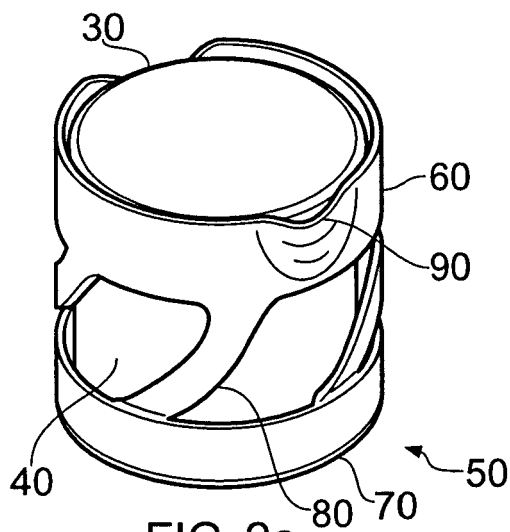


FIG. 2a

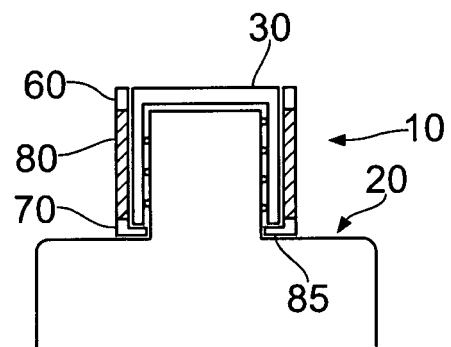


FIG. 2b

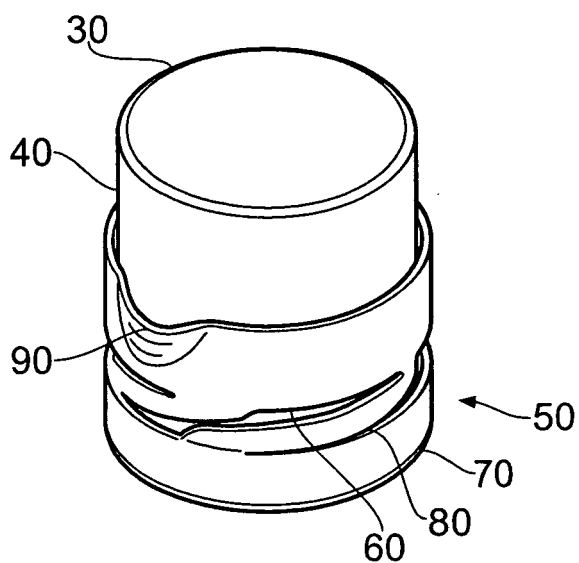


FIG. 3a

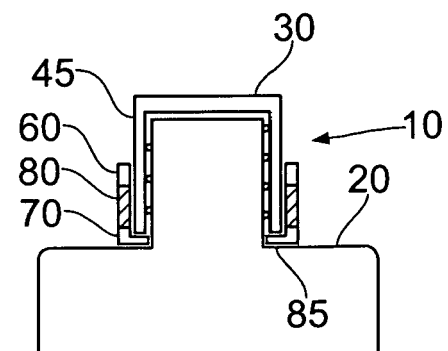


FIG. 3b

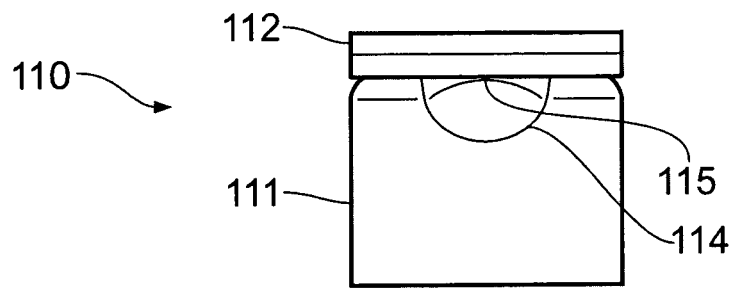


FIG. 4a

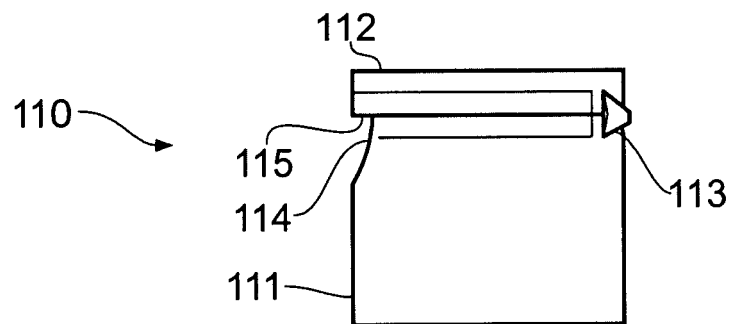


FIG. 4b

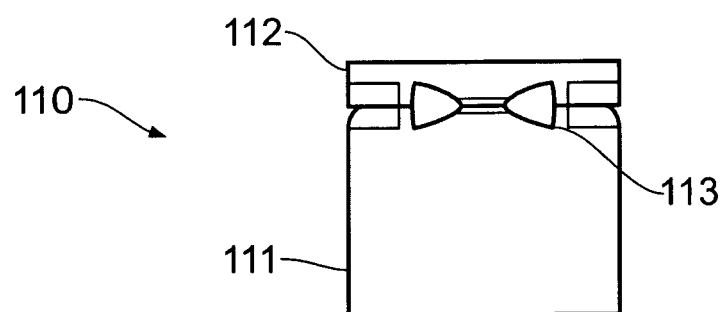


FIG. 4c

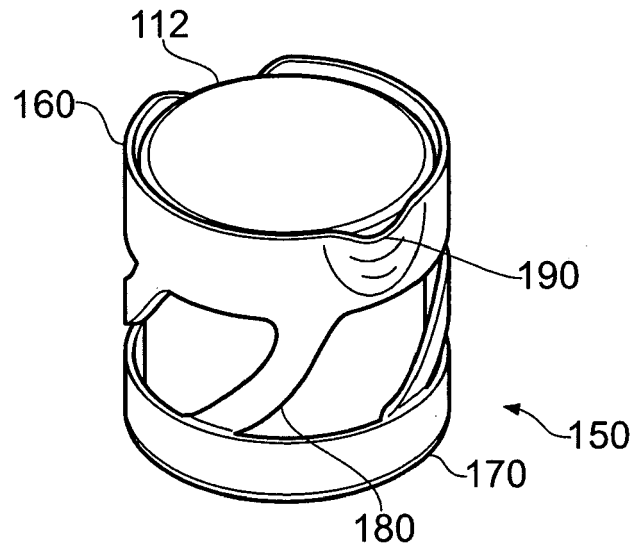


FIG. 5

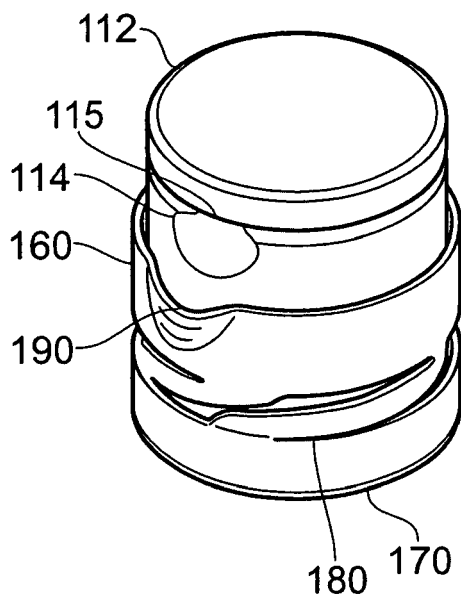


FIG. 6

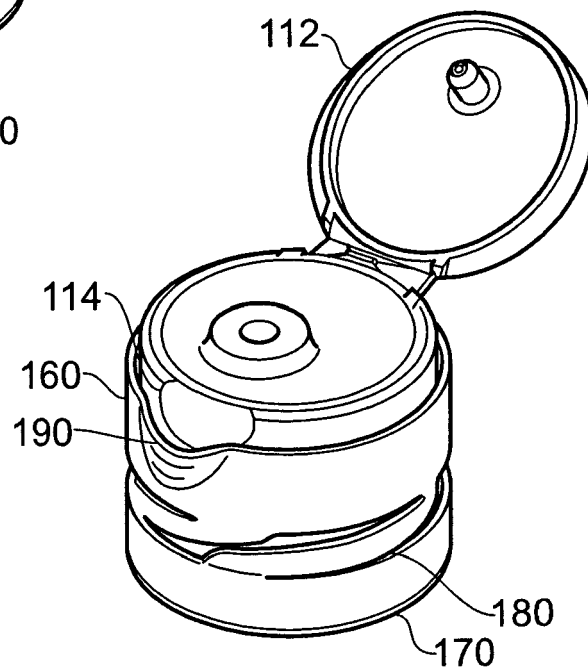


FIG. 7

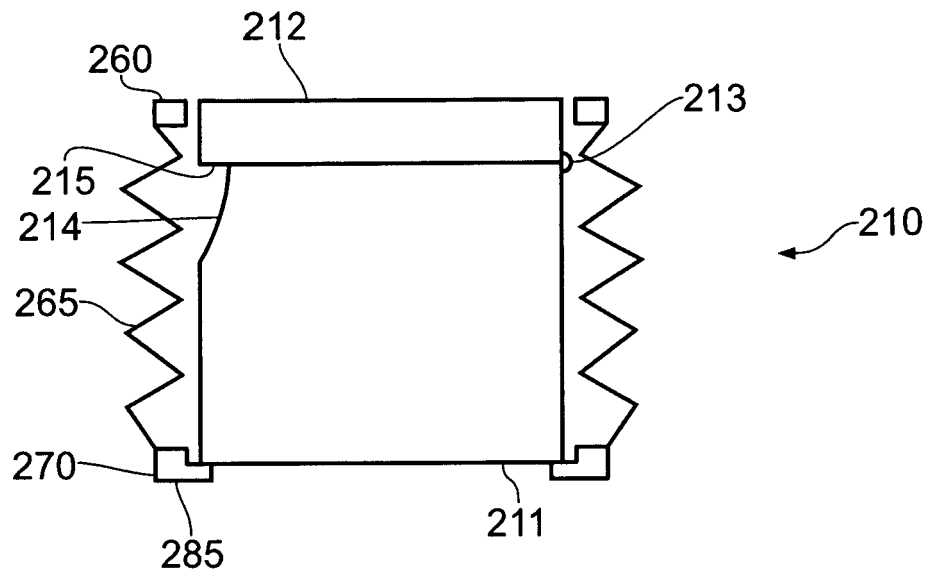


FIG. 8a

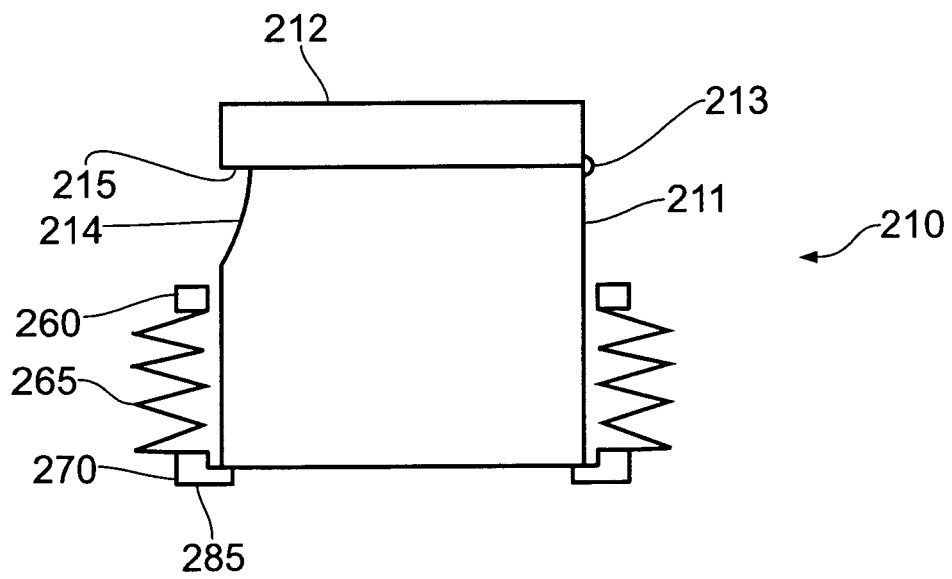


FIG. 8b

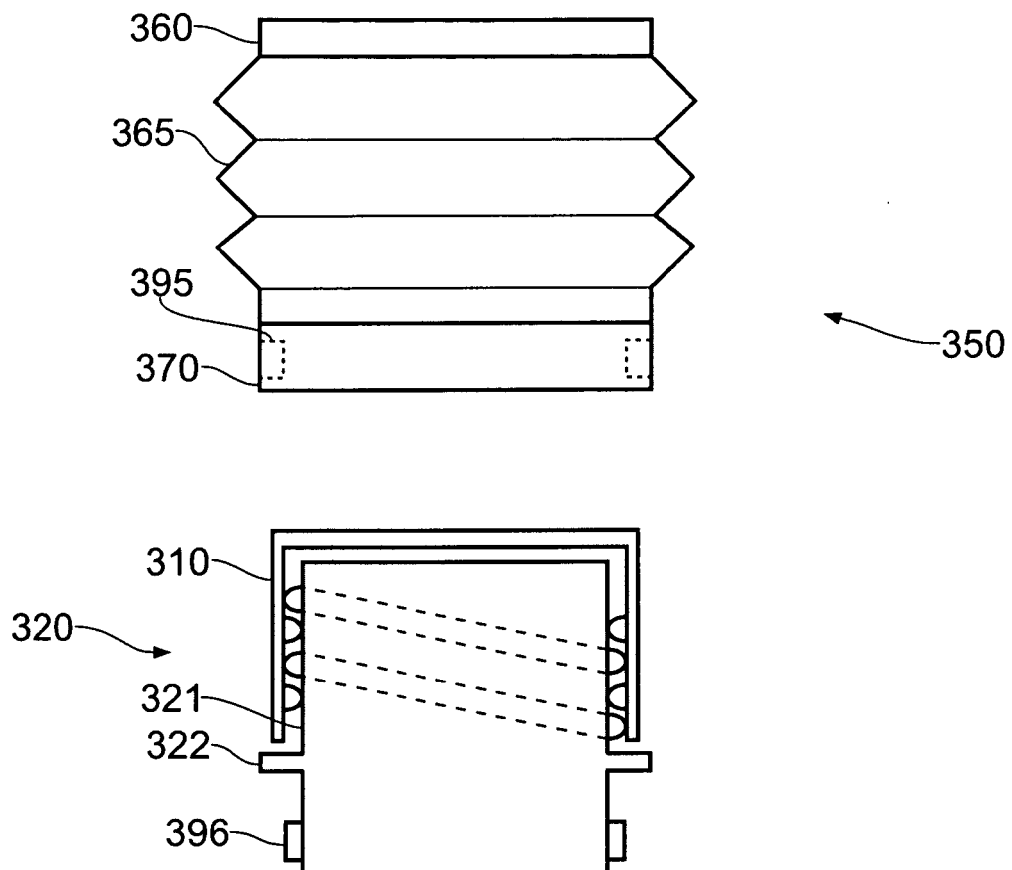


FIG. 9

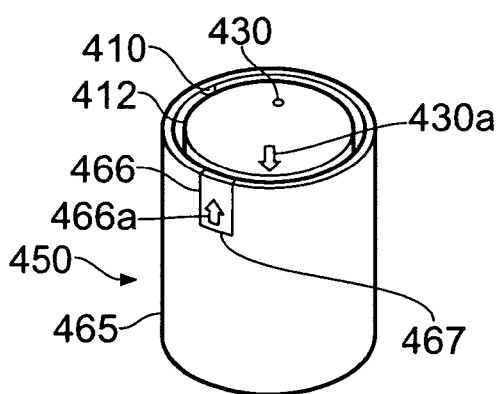


FIG. 10a

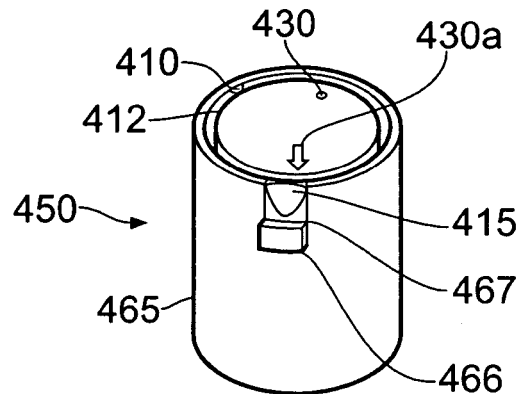


FIG. 10b

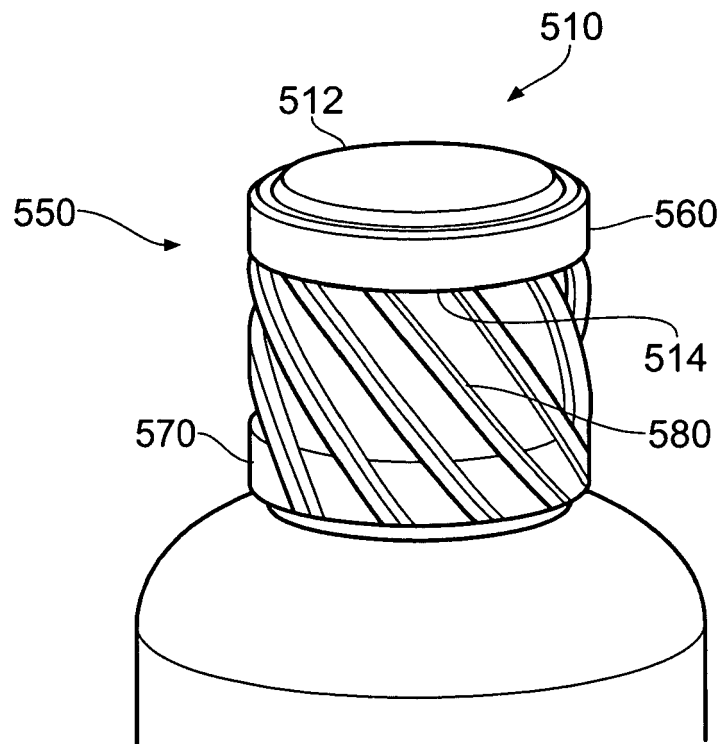


FIG. 11

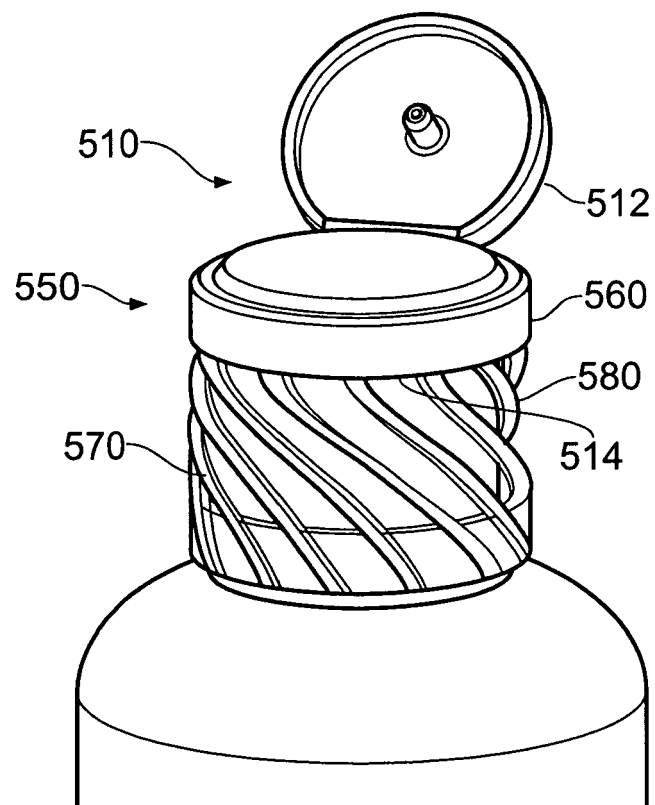


FIG. 12



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 08 25 0122

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Place of search The Hague		Date of completion of the search 9 April 2008	Examiner Fournier, Jacques
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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