(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 789 346 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
30.04.2008 Bulletin 2008/18

(21) Application number: **05796523.8**

(22) Date of filing: **15.09.2005**

(51) Int Cl.:
B65D 83/16 *(2006.01)* ***B05B 1/00*** *(2006.01)*

(86) International application number:
PCT/US2005/033015

(87) International publication number:
WO 2006/031990 (23.03.2006 Gazette 2006/12)

(54) **ACTUATOR CAP**

BETÄTIGUNGSKAPPE

BOUCHON A ACTIONNEUR

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(30) Priority: **15.09.2004 US 941791**
08.12.2004 US 6930
08.12.2004 US 7070
12.05.2005 US 127492

(43) Date of publication of application:
30.05.2007 Bulletin 2007/22

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WO-A-01/26995
US-A- 3 404 814
US-A- 3 739 941
US-A- 3 888 392
US-A- 3 946 911

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to actuating apparatus, and more particularly to a actuator cap which when placed on a container can be used to dispense product from the containers. It also relates to a product refill including the cop with a container of product and system including the refill and a housing.

2. Description of the Background of the Invention

[0002] Various apparatus for dispensing product from a container or reservoir of product have been developed US 340 4814 discloses an apparatus which is seen as the closest prior-art. Smrt U.S. Patent No. 5,287,998 discloses an actuator fitted to a container and including an axially extending passage therethrough for discharging product. The actuator includes a pair of wings that extend transversely from the actuator. The container may be moved axially within a device such that the wings bear against a surface defining a passage, thereby discharging product through the passage.

[0003] Brotspies et al. U.S. Patent No. 6,386,397 discloses a spray bottle grip used with a nasal spray bottle. The grip is coupled to a reciprocating nozzle of the spray bottle, and two arms extend downwardly along the spray bottle. The arms include finger flanges that provide an ergonomic means of reciprocating the nozzle to dispense product from the spray bottle.

[0004] Haas U.S. Patent No. 3,318,492 discloses a disc-shaped actuator attached to a nozzle of a container. A user may depress the actuator with his finger to dispense product from the container.

[0005] Scheindel et al. U.S. Patent No. 6,340,103 discloses a handle extending along a container body. When a user pulls the handle toward the container body, a portion of the handle pushes downwardly upon a nozzle portion of the container to dispense product from the container.

[0006] Micallef U.S. Patent No. 4,138,039 discloses a container having a vertically reciprocating tubular pump. A cap is fitted to the container and includes an actuator button extending from a sidewall of the cap. Movement of the actuator button in a direction toward the sidewall of the cap is translated into perpendicular reciprocating movement of the pump.

[0007] Other patents disclose devices having a container of product disposed at a first end of a rod and having a trigger mechanism at a second end of the rod wherein a user may actuate the container from a distance. Discharging product from a distance can be an advantage for many purposes, such as accessing hard-to-reach places or perhaps for discharging an insecticide into a hornet nest without placing oneself too close to the nest. Smrt U.S. Patent No. 5,518,148 discloses a device where an actuating rod has a trigger on a first end and a container on a second end. Pulling the trigger moves the actuating rod longitudinally such that the second end of the rod moves a bell crank, which in turn, moves an additional rod that actuates a valve on the container. Aberegg et al. U.S. Patent No. 6,551,001, assigned to the assignee of the present application and the disclosure of which is incorporated by reference herein, discloses a cleaning device having a trigger at a first end of a rod and a mop cleaning head and a container at a second end of the rod. Pulling the trigger moves a pivot link, which in turn actuates a valve of the container, thereby discharging product from the container onto the surface to be cleaned by the mop cleaning head.

[0008] Adams et al. U.S. patent No. 5,358,147, assigned to the present assignee and also incorporated herein by reference, discloses a container of air freshener inserted into a shroud. The shroud includes a nozzle that is fitted over a valve stem of the container. The combination of the container and the shroud is placed within a housing. When a user wishes to spray air freshener into ambient air, the user pushes the housing, which in turn pushes the shroud and the valve stem to dispense the air freshener out of the housing.

US 3 404 814 shows an arrangement in Fig. 9 in which a pair of pillars flank an actuator member resting on the valve of an aerosol can. The pillars are connected to the actuator by webs, which link a position high on the pillar with a position low on the actuator. Manually squeezing the two pillars together causes a force to be transmitted to the actuator member pressing it downwards and operating the valve. This document forms the basis for the pre-characterizing part of claim 1.

US 3 946 911 discloses an aerosol can with a cap having a valve stem on which is disposed an inverted T-shape actuator. The cap has a central conical hollow with radial cups giving rise to an annular series of triangular webs, each extending from the outer periphery of the can towards the middle. The centre edge of each of the webs rests on the inverted T-actuator. To actuate the can it is necessary to squeeze the top of the cap, which then causes the triangular webs to tilt pressing down the actuator. The actuator and the triangular webs are not integral.

US 3 888 392 discloses an aerosol can with a cap having outwardly extending wings of a generally inverted right-angled triangular shape hinged at the can chime. The valve actuator is generally a cylindrical hollow block. The upper edge of the triangular wings overlap the actuator block. Squeezing the wings together therefore has the effect of pressing down the cylindrical actuator block.

SUMMARY OF THE INVENTION

[0009] In accordance with a first aspect the invention provides an actuator cap as defined in claim one below. The invention also includes a product refill as defined in claim 7 below and a system comprising a product refill

and a housing as defined in claim 8 below.

[0010] Other aspects and advantages of the present invention will become apparent upon consideration of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is an exploded isometric view of a container and actuator cap;

[0012] FIG. 2 is an exploded isometric view of a housing into which the container and actuator cap of FIG. 1 may be placed;

[0013] FIG. 3 is a side elevational view showing a rod and trigger mechanism in combination with the housing of FIG. 2;

[0014] FIG. 4 is a sectional view taken generally along the lines 4-4 of FIG. 3 further illustrating the container of FIG. 1 in elevation and the actuator cap thereof in section;

[0015] FIG. 5 is an enlarged fragmentary view of FIG. 4;

[0016] FIG. 6 is a view similar to FIG. 5, but showing the actuator cap of FIG. 1 in an actuating position;

[0017] FIG. 7 is a plan view of the actuator cap of FIG. 1;

[0018] FIG. 8 is a sectional view taken generally along the lines 8-8 of FIG. 7;

[0019] FIG. 9 is a bottom elevational view of the actuator cap of FIG. 1;

[0020] FIG. 10 is an enlarged fragmentary isometric view of components of the actuator cap of FIG. 1;

[0021] FIG. 11 is an enlarged fragmentary bottom elevational view of the components of the actuator cap of FIG. 1;

[0022] FIG. 12 is a sectional view taken generally along the lines 12-12 of FIG. 10;

[0023] FIG. 12A is a sectional view similar to FIG. 12, but showing an alternative adapter;

[0024] FIG. 13 is a diagrammatic and fragmentary side elevational view of components of the actuator cap of FIG. 1;

[0025] FIG. 14 is a diagrammatic and fragmentary side elevational view of components of an actuator cap similar to the actuator cap of FIG. 1;

[0026] FIGS. 15 is a diagrammatic and fragmentary side elevational view illustrating an alternative actuator arm and pillar design;

DETAILED DESCRIPTION OF THE DRAWINGS

[0027] Referring to FIG. 1, a container 50 has a valve stem 52 and a main body 56 containing product. The valve stem 52 could be either a vertically depressible valve stem or a tilt valve stem. As will be appreciated hereinafter, if a tilt valve stem is utilized such stem could also alternatively be depressed vertically without tilting to dispense product therethrough. It should be noted that the valve stem 52 could be replaced by any suitable apparatus that may be displaced to release product from the container 50. An actuator cap 60 is fitted to the container 50. FIG. 2 illustrates a housing 70 into which the container 50 and the actuator cap 60 may be placed. The container 50 and the actuator cap 60 are a product refill for the housing 70. It should be noted that the product refill may include additional components (not shown) besides the container 50 and the actuator cap 60, such as a sleeve (not shown) disposed around the container 50. The actuator cap 60 has deflectable valve actuating apparatus in the form of deflectable pillars 78a-78f and any suitable central adapter 80 secured to the valve stem 52. The housing 70 has a discharge opening 82 through which product stored within the container 50 may be dispensed. Referring to FIGS. 3 and 4, relatively moving the container 50 and the housing 70 such that the container 50 is moved toward the discharge opening 82 deflects the pillars 78, thereby actuating the valve stem 52 as described hereinbelow, causing product to be released from the container 50 and dispensed from the housing 70. A rod and trigger mechanism 84 may be used to move the container 50 within the housing 70. The mechanism 84 includes a hollow tube 86 with a handle assembly 88 at a first end 90 of the tube 86, and a second end 92 of the tube 86 is secured within a sleeve 94 of the housing 70 in any suitable manner such as by welding or appropriately threading the sleeve 94 and the end 92. Pulling a trigger 96 of the handle assembly 88 advances a push rod 100 disposed within the tube 86 against a bottom surface 102 of the container 50, thereby advancing the container 50 toward the discharge opening 82. If necessary or desirable, an end 104 of the push rod 100 may be shaped and/or fitted with a plate or other member to distribute forces more evenly across the bottom surface 102 of the container 50. Further, if desired, rather than moving the container 50 relative to the housing 70 by using the rod and trigger mechanism 84 one could move the container 50 and/or the housing 70 relative to one another by hand to dispense product.

[0028] The housing 70 includes a wall 108 that decreases in cross sectional size, tapering to the discharge opening 82. The discharge opening 82 has a cross sectional size greater than a radius R (FIG. 1) of the container 50. Referring again to FIG. 2, the housing 70 may include first and second wall portions 114, 116 that may be joined together to house the container 50 and the actuator cap 60 fitted thereto. The wall portion 114 may include three bayonet slots 118a-118c disposed on an end 120 of the portion 114 and equally spaced from one another by 120 degrees. To join the portions 114, 116, a user inserts pins 124 carried by an end 126 of the portion 116 into the slots 118a-118c and provides a relative rotation of the portions 114, 116 to seat the pins 124 within recessed regions 130a-130c of the slots 118.

[0029] Either of the portions 114, 116 may include protrusions 136 such as guide fins 138 having edges 140 that abut the exterior surface of the container 50 to center the container 50 within the housing 70. Either of the portions 114, 116 may include elongate openings or win-

dows 144 that allow a user to see the container 50 when the container 50 is disposed within the housing 70. The housing portions 114, 116 may include three of the windows 144 spaced apart by 120 degrees. One advantage of the windows 144 is that a user might see any written directions or graphics disposed on the container 50. Referring to FIG. 6, a main region 150 of the wall portions 114 and 116 may have an inner cross sectional size C1 of about 66 mm, and thus the product refill, comprising the container 50 and the actuator cap 60, could have a cross sectional size of up to about 66 mm. In this regard, while a range of sizes is available for the container 50 one might wish to provide a container sized at or near maximum to provide a maximum useful life for the container 50 given the available space within the housing 70.

[0030] Referring to FIG. 8, the actuator cap 60 decreases in cross sectional size along an axial dimension defined between a first end 152 for fitting to the container 50 and a second end 154. The actuator cap 60 provides a useful centering function in that peripheral surfaces 156a-156f of the pillars 78a-78f maintain a point of discharge 160 of the actuator cap 60 in a centrally located position relative to the discharge opening 82, thereby minimizing the potential for product impingement against a surface 164 of the tapered wall 108. The surfaces 156 may optionally be tapered. Referring also to FIG. 5, the pillars 78a-78f of the actuator cap 60 have a length L defined between a longitudinal centerline C (FIG. 5) of the cap 60 and a peripheral surface 168 of the pillars 78a-78f. The length L is selected relative to the inner dimensions of the tapered wall 108 such that the peripheral surface 168 is disposed in interfering relationship with the tapered wall 108. It should be appreciated that the actuator cap 60 and/or the pillars 78 could have any suitable shape so long as the pillars 78 are sized to have an interference relationship with the tapered wall 108. The length L may have any suitable value such as greater than about one-quarter (25%) a largest diameter of the product refill or greater than or equal to one-third (33%) the largest diameter of the product refill, whether the largest diameter is defined by the container 50, the actuator cap 60, or some other component of the product refill. The length L may be greater than one-quarter (25%) of a largest diameter D of the cap 60, measured at the first end 152. The length L may be greater than or equal to one-third (33%) the largest diameter D. Of course, the length L may be alternatively expressed relative to the size of the container 50. In any event, a largest lateral dimension across the product refill cannot exceed the internal cross sectional size C1 (FIG. 6) of the housing 70, and L may have any suitable value such as greater than one-quarter (25%) of this largest lateral dimension C1. One could select any suitable cross sectional size S (FIG. 5) for the discharge opening 82, such as a cross sectional size of about 34 mm, and suitable values of L might range between about 18 mm and about 33 mm to provide the above-described interfering relationship. A preferred value for L may be about 25 mm. It should be noted that while the tapered wall 108 of the housing 70 is illustrated as symmetrical around the longitudinal centerline C of the housing 70, the wall 108 could be made asymmetrical, greater in cross sectional size in one plane rather than another, and the shape of the actuator cap 60 could be made complementary therewith to serve as a keying function to orient the container 50 relative to the housing 70 in a particular angular orientation. This could be advantageous for various reasons, such as where product discharges in an asymmetrical pattern.

[0031] Referring to FIG. 8, the pillars 78 are cantilevered from a main peripheral wall 170 of the actuator cap 60, attached thereto at a hinge point 174. The pillars 78 are capable of being deflected radially inwardly toward the central adapter 80 about - the hinge point 174. The pillars 78 are hollow, and arcuate strengthening ribs 176 bisect the hollow pillars 78. The ribs 176 connect an internal surface 180 of the main peripheral wall 170 to internal surfaces 184a-184f (FIG. 9) of the pillars 78. During deflection of the pillars 78, each of the pillars 78 moves unitarily. Referring to FIGS. 5, 6, and 8, a lower edge 187 of the ribs 176 may be positioned sufficiently close to the hinge point 174 such that the ribs 176 need not substantially flex during deflection of the pillars 78. The central adapter 80 is secured to the valve stem 52 as shown in FIGS. 5 and 6. The central adapter 80 includes a nozzle member 190 having a tapered surface 192 to facilitate insertion of the valve stem 52 therein.

[0032] Referring to FIGS. 7, 8, and 10, the pillars 78b, 78d, and 78f carry posts 214a, 214b, 214c disposed in notches 215a, 215b, 215c of actuator arnis 216a, 216b, 216c. Referring to FIGS. 10 and 8, the arms 216a-216c extend from the central adapter 80 transversely to the axial dimension of the cap 60 and the arms 216a-216c are cantilevered from the central adapter 80. The arms 216a-216c are spaced apart by 120 degrees. Flexible strap members 218, 219, 220 also extend from the central adapter 80 and flexibly connect the central adapter 80 to the main peripheral wall 170 of the cap 60. The strap members 218, 219, 220 are disposed between the arms 216a-216c and are also spaced apart by 120 degrees. The strap members 218, 219, 220 and the arms 216 are disposed in recesses defined between the pillars 78a-78f. Referring to FIG. 8, a cover (not shown) could be fitted to the actuator cap 60 at the position of a phantom line 222 to shield the pillars 78, thereby preventing inadvertent dispensing of product during shipment. The cap 60 may include a ledge 224 modified as necessary for seating the cover. The actuator cap 60 may include a circumferential inwardly-tapered flange 226 and a plurality of spaced apart inwardly-directed beads 228. As shown in FIGS. 5 and 6, the flange 226 and the beads 228 are snap fitted over a rim 230 of the container 50.

[0033] Referring to FIG. 6, relatively moving the container 50 and the housing 70 such that the main body 56 of the container 50 and the discharge opening 82 are moved toward each other causes the peripheral surfaces 156 of the pillars 78 to engage the surface 164 of the

tapered wall 108, thereby deflecting the pillars 78. During such deflection, the pillars 78 tip inwardly about the hinge point 174, bowing toward the central adapter 80. The posts 214a-214c press against the arms 216a-216c, thereby deflecting the arms 216a-216c and thus displacing the central adapter 80 axially toward the container 50. Sufficient displacement of the central adapter 80 to an actuating position thereof displaces the valve stem 52 into the container 50 such that product dispenses from the container 50, through a spray tip 240 of the nozzle member 190 and out of the housing 70. It should be noted that providing a plurality of the actuator arms 216 and the posts 214 at spaced apart positions, such as 180 degrees or 120 degrees, ensures substantially axial reciprocating movement of the valve stem 52, rather than tilting movement, potentially minimizing product discharge against the tapered wall 108. For example, referring to FIG. 13, if only a single pillar and actuator arm were employed, the central adapter 80 would tilt upon deflection of such single actuator arm. In contrast, it should be evident from FIG. 14 that providing multiple pillars and actuator arms, circumferentially spaced apart by a suitable distance, ensures substantially axial movement of the valve stem 52. It should also be noted that the notches 215 should preferably be sized larger than the posts 214. In this regard, considering the pillars 78 and thus the posts 214 traverse an arcuate path, oversizing the notches 215 accommodates radial sliding movement of the posts 214 as the posts 214 deflect the arms 216 axially toward the container 50.

[0034] Referring to FIG. 15, an alternative actuator arm 400 could include a rod 402 or other projection extending therefrom into a deflection path R of one or more pillars 406, similar or identical to the pillars 78. As the pillar 406 moves along the deflection path R, a surface 410 of the pillar 406 pushes the rod 402, and thus deflects the actuator arm 400 axially in the direction of an arrow A.

[0035] The actuator cap embodiments disclosed herein may be designed to reduce the likelihood of inadvertent dispensing that might result from a user inadvertently shaking or jostling the housing 70 with the container 50 disposed therein. In this regard, the pillars. 78 while deflectable toward the central adapter 80 have an inherent resistance to movement, and a manufacturer may increase or decrease this resistance as desired for a particular actuator cap design. For example, the pillars 78 may be provided with a resilient bias outward away from the central adapter 80. In order to axially displace the central adapter 80 a sufficient distance to the actuating position, thereof, an amount of force must be applied that is sufficient to overcome the bias of the pillars 78, and thus move the pillars 78 to allow sufficient deflection of the actuator arms 216a-216c to the actuating position thereof.

[0036] Because the pillars 78 must be deflected in order for dispensing to occur, a sufficient amount of external mechanical force must act upon the actuator cap 60 to overcome the resistance provided by the pillars 78. In this regard, this resistance of the pillars 78 against movement provides a reactive force against forces directing the container 50 toward the discharge opening 82, such that this reactive force must be overcome before dispensing may occur. This reactive force is advantageous in that low force levels may be insufficient to overcome same to dispense product from the housing 70. For example, such low force levels may occur from a user jostling the housing 70 while walking or manipulating the housing 70 or may arise as a user shakes the housing 70 to mix the contents of the container 50. Such jostling could cause the cap 60 to be in a condition where the pillars 78 are slightly deflected and the actuator arms 216a-216c are either undeflected or deflected to a lesser extent than the actuating position thereof. Ideally, the reactive force provided by the pillars 78 prevents inadvertent dispensing until such time as the user intentionally applies sufficient force, thereby radially deflecting the pillars 78 and axially deflecting the actuator arms 216a-216c to the actuating position thereof. Thus, the user can pull the trigger 96 shown in FIG. 3 to intentionally dispense product, while inadvertent dispensing is avoided.

[0037] The foregoing embodiments may provide one or more of the following advantages.

[0038] First, because the deflectable pillars 78 have a sufficiently large value of L, the pillars 78 have an interfering relationship with the tapered wall 108, and thus, the actuator cap 60 is usable with the housing 70 despite the large discharge opening 82. (As noted above, the cross sectional size of the discharge opening 82 is greater than the container radius R.) Containers lacking an actuating apparatus of the length L are not usable with the housing 70. This may be useful because containers lacking a cap with the deflectable pillars 78 of length L may not be designed for use with the housing 70 or the housing 70 may not be marketed for use with a particular container of product that lacks the pillars 78. For example, the housing 70 may be marketed for use with a container of a specific type of insecticide having the actuator cap 60. A further advantage of the large discharge opening 82 and large value of L is that contact near the point of discharge 160 is avoided. Because the tapered wall 108 contacts the peripheral surfaces 156 at the distance L from the orifice of the valve stem 52, the potential for product obstruction or impingement is minimized. This feature could be especially advantageous for some products that fan out while discharging from the container 50 as the product gets farther away from the container 50. The large cross sectional size of the discharge opening 82 would accommodate such fanning out while minimizing potential product impingement or deposition thereupon. A further advantage of the large size of the discharge opening 82 is that the surface 164 of the tapered wall 108 might be potentially more easily manually accessed for cleaning than other housing types.

[0039] The product stored within the container body 56 could be any of a broad variety of products such as an air freshener, an insect control agent, a hair spray, a

cleaning agent, a polishing agent, a fragrance, or other any other product stored in a container. Further, the product may be pressurized by a suitable propellant disposed within the container 50.

INDUSTRIAL APPLICABILITY

[0040] The foregoing embodiments are useful for dispensing a variety of products such as insecticides, cleaning products, air treatment products (e.g., air fresheners), or other products.

[0041] Numerous modifications to the present invention will be apparent to those skilled in the art in view of the foregoing description. Accordingly, this description is to be construed as merely exemplary of the inventive concepts taught herein and is presented for the purpose of enabling those skilled in the art to make and use the invention and to teach the best mode of carrying out same. The exclusive rights to all modifications which come within the scope of the appended claims are reserved.

Claims

1. An actuator cap (60) for a container of product, comprising:

   a main peripheral wall (170);
   a central discharge member (80) axially movable relative to the main peripheral wall (170) and oriented to discharge product substantially axially, the discharge member having multiple flexible strap (218, 219, 220) members attaching it to the main peripheral wall (170); and
   multiple pillars (78a-78f) disposed around the central discharge member (80) and having a peripheral surface, each pillar being radially deflectable relative to the main peripheral wall (170) in a direction toward the central discharge member (80), wherein movement of the pillar is communicated to the central discharge member (80) to displace the central discharge member axially when the pillar is deflected;
   - **characterized in that** the central discharge member (80) has multiple radially extending arms (216a-216c) extending in a direction from the central discharge member toward the main peripheral wall;
   the radially extending arms (216a-216c) and the flexible strap members (218, 219, 220) being disposed in recesses defined between the pillars (78a-78f); and either

      a) a pillar (78b, 78d, 78f) adjacent each of the radially extending arms (216a-216c) has a transversely extending post (214a-214c) extending therefrom such that when the pillar is deflected inwardly towards the central discharge member, the post presses on the radially extending arm thereby communicating said movement, or
      b) the radially extending arms (400) each have a transversely extending rod (402) disposed in the path of the pillar (406), thereby communicating said movement.

2. The actuator cap of claim 1, wherein the pillars (78a-78f) are biased radially away from the central discharge member (80).

3. The actuator cap of claims 1 or 2, wherein a distance is measured between an exterior surface of the pillars (78a-78f), and an axial centerline of the cap (60) and wherein the distance is greater than one-quarter the diameter of an end of the cap (60) for fitting to the container.

4. The actuator cap of any preceding claim, wherein the peripheral surface is tapered.

5. The actuator cap of claim 1, including the said transversely extending post (214a-214c), wherein the radially extending arm (216a-216c) has a notch (215a-215c) in its upper surface in which the post can slide.

6. The actuator cap of any preceding claim, wherein the cap has six pillars (78a-78f), three flexible straps (218, 219, 220) and three radially extending arms (216a-216c).

7. A product refill for a housing, comprising:

   an actuator cap (60) in accordance with any preceding claim;
   a container of product (50), wherein the cap (60) is fitted on the container with the central discharge member (80) in contact with a discharge valve (52) of the container (50) so that axial movement of the discharge member (80) actuates the valve (52).

8. A system comprising a product refill as defined in claim 7 in combination with a housing (70) having a housing wall (150) that tapers to a discharge opening (82) and wherein the discharge opening (82) has a cross sectional size larger than a radius of the container and wherein the pillars (78a-78f) are disposed in interfering relationship with the housing wall.

Patentansprüche

1. Betätigungskappe (60) für einen Behälter mit Produktinhalt, die aufweist:

eine Haupt-Umfangswand (170);
ein mittiges Austrittselement (80), das relativ zur Haupt-Umfangswand (170) axial bewegbar und so orientiert ist, dass es das Produkt im wesentlichen axial freisetzt, wobei das Austrittselement mehrere biegsame Bandelemente (218, 219, 220) aufweist, mit denen es an die Haupt-Umfangswand (170) angesetzt ist; und
mehrere Säulen (78a-78f), die um das mittige Austrittselement (80) herum angeordnet sind und eine Außenfläche aufweisen, wobei jede Säule relativ zur Haupt-Umfangswand (170) zum mittigen Austrittselement (80) hin radial auslenkbar ist und die Bewegung der Säule auf das mittige Austrittselement (80) übertragen wird, um letzteres beim Ausbiegen der Säule axial zu verschieben;
dadurch gekennzeichnet, dass das mittige Austrittselement (80) mehrere radial sich erstreckende Arme (216a-216c) aufweist, die vom mittigen Austrittselement weg zur Haupt-Umfangswand hin verlaufen;
die radial sich erstreckenden Arme (216a-216) und die biegsamen Bandelemente (218, 219, 220) in Ausnehmungen liegen, die zwischen den Säulen (78a-78f) belassen sind; und dass entweder

(a) eine Säule (78b, 78d, 78f) angrenzend an jeden der radial sich erstreckenden Arme (216a-216c) einen quer verlaufenden Pfosten (214a-214c) aufweist, der von ihr so absteht, dass, wenn die Säule einwärts zum mittigen Austrittselement hin ausgebogen wird, der Pfosten auf den radial sich erstreckenden Arm drückt und damit die Bewegung überträgt; oder
(b) die radial sich erstreckenden Arme (400) jeweils einen quer verlaufenden, im Weg der Säule (406) liegenden Stab (402) aufweist, womit die Bewegung übertragen wird.

2. Betätigungskappe nach Anspruch 1, bei der die Säulen (78a-78f) vom mittigen Austrittselement (80) radial weg vorgespannt sind.

3. Betätigungskappe nach Anspruch 1 oder 2, bei der eine Entfernung zwischen einer Außenfläche der Säulen (78a-78f) und einer axialen Mittellinie der Kappe (60) gemessen wird und diese Entfernung größer ist als ein Viertel des Durchmessers eines Endes der Kappe (60), mit dem sie auf den Behälter aufgesetzt wird.

4. Betätigungskappe nach einem der vorgehenden Ansprüche, bei der die Außenfläche verjüngt verläuft.

5. Betätigungskappe nach Anspruch 1, mit dem genannten quer verlaufenden Pfosten 214a-214c), wobei der radial sich erstreckende Arm (216a-216c) in seiner oberen Oberfläche eine Kerbe (215a-215c) enthält, in der der Pfosten gleiten kann.

6. Betätigungskappe nach einem der vorgehenden Ansprüche, bei der die Kappe sechs Säulen (78a-78f), drei biegsame Bandelemente (218, 219, 220) und drei radial sich erstreckende Arme (216a-216c) aufweist.

7. Produktnachfüllanordnung für ein Gehäuse, die aufweist:

eine Betätigungskappe (60) nach einem der vorgehenden Ansprüche;
einen Behälter (50) mit Produktinhalt, auf den die Kappe (60) so aufgesetzt ist, dass das mittige Austrittselement (80) in Kontakt mit einem Austrittsventil (52) des Behälters (50) steht und eine Axialbewegung des Austrittselements (80) das Ventil (52) betätigt.

8. System, das eine Produktnachfüllanordnung nach Anspruch 7 in Kombination mit einem Gehäuse (70) aufweist, das eine Gehäusewand (150) hat, die sich zu einer Austrittsöffnung (82) hin verjüngt, wobei die Querabmessung der Austrittsöffnung (82) größer ist als der Behälterradius und die Säulen (78a-78f) an der Gehäusewand anliegen.

Revendications

1. Bouchon à dispositif d'actionnement (60) pour un récipient de produit, comportant :

une paroi périphérique principale (170) ;
un élément de sortie central (80) axialement mobile par rapport à la paroi périphérique principale (170) et orienté afin de libérer du produit de manière sensiblement axiale, l'élément de sortie ayant de multiples éléments de bande flexible (218, 219, 220) qui le fixent sur la paroi périphérique principale (170) ; et
de multiples supports (78a à 78f) disposés autour de l'élément de sortie central (80) et ayant une surface périphérique, chaque support pouvant être fléchi radialement par rapport à la paroi périphérique principale (170) en direction de l'élément de sortie central (80), le mouvement du support étant communiqué à l'élément de sortie central (80) afin de déplacer axialement l'élément de sortie central lorsque le support est fléchi ;
caractérisé en ce que l'élément de sortie central (80) a de multiples bras s'étendant radiale-

ment (216a à 216c) qui s'étendent dans une direction depuis l'élément de sortie central vers la paroi périphérique principale ;
les bras s'étendant radialement (216a à 216c) et les éléments de bande flexible (218, 219, 220) étant disposés dans des renfoncements définis entre les supports (78a à 78f) ; et soit

a) un support (78b, 78d, 78f) adjacent à chacun des bras s'étendant radialement (216a à 216c) a une fiche s'étendant transversalement (214a à 214c) qui s'étend depuis celui-ci de telle sorte que, lorsque le support est fléchi vers l'intérieur vers l'élément de sortie central, la fiche appuie sur le bras s'étendant radialement en communiquant ainsi ledit mouvement, soit
b) les bras s'étendant radialement (400) ont chacun une tige s'étendant transversalement (402) disposée dans le passage du support (406), en communiquant ainsi ledit mouvement.

2. Bouchon à dispositif d'actionnement selon la revendication 1, dans lequel les supports (78a à 78f) sont rappelés radialement à l'écart de l'élément de sortie central (80).

3. Bouchon à dispositif d'actionnement selon les revendications 1 ou 2, dans lequel une distance est mesurée entre une surface extérieure des supports (78a à 78f), et un axe central du bouchon (60) et dans lequel la distance est plus grande d'un quart du diamètre d'une extrémité du bouchon (60) pour montage sur le récipient.

4. Bouchon à dispositif d'actionnement selon l'une quelconque des revendications précédentes, dans lequel la surface périphérique est effilée.

5. Bouchon à dispositif d'actionnement selon la revendication 1, comprenant ladite fiche s'étendant transversalement (214a à 214c), le bras s'étendant radialement (216a à 216c) ayant une encoche (215a à 215c) dans sa surface supérieure dans laquelle la fiche peut coulisser.

6. Bouchon à dispositif d'actionnement selon l'une quelconque des revendications précédentes, dans lequel le bouchon a six supports (78a à 78f), trois bandes flexibles (218, 219, 220) et trois bras s'étendant radialement (216a à 216c) .

7. Recharge de produit pour un boîtier, comportant :

un bouchon à dispositif d'actionnement (60) selon l'une quelconque des revendications précédentes ;

un récipient de produit (50), le bouchon (60) étant monté sur le récipient avec l'élément de sortie central (80) en contact avec une soupape de sortie (52) du récipient (50) de telle sorte qu'un mouvement axial de l'élément de sortie (80) actionne la soupape (52).

8. Système comportant une recharge de produit selon la revendication 7 en combinaison avec un boîtier (70) ayant une paroi de boîtier (150) qui s'effile vers une ouverture de sortie (82) et dans lequel l'ouverture de sortie (82) a une section plus grande qu'un rayon du récipient et dans lequel les supports (78a à 78f) sont disposés en relation d'interférence avec la paroi de boîtier.

FIG. 1

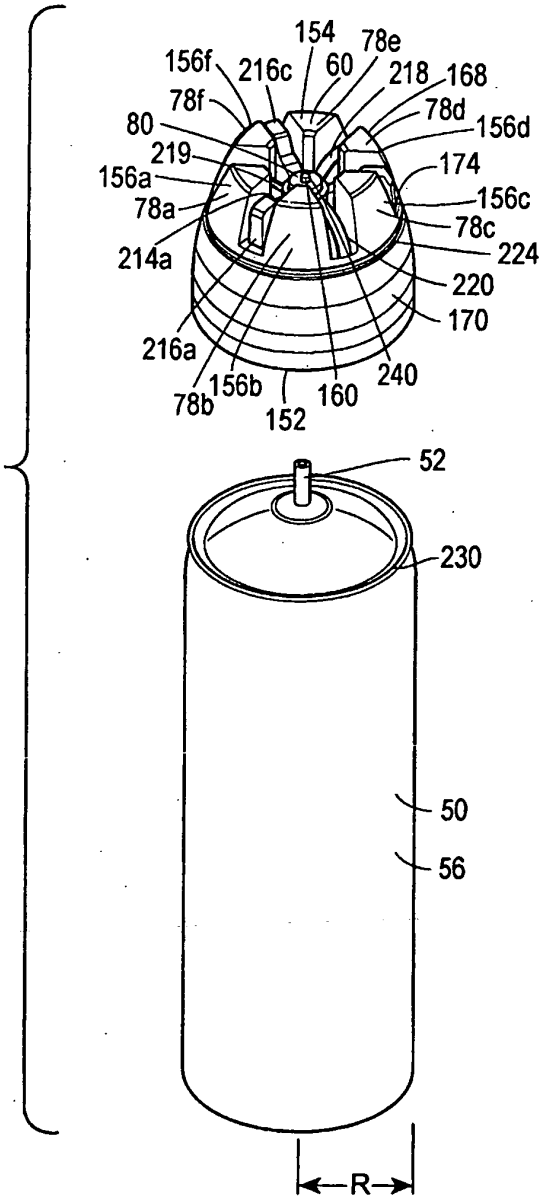

154
78e
156f
216c
60
218
168
78f
78d
80
156d
219
174
156a
156c
78a
78c
214a
224
220
170
216a
240
78b
156b
160
152
52
230
50
56
R

FIG. 2

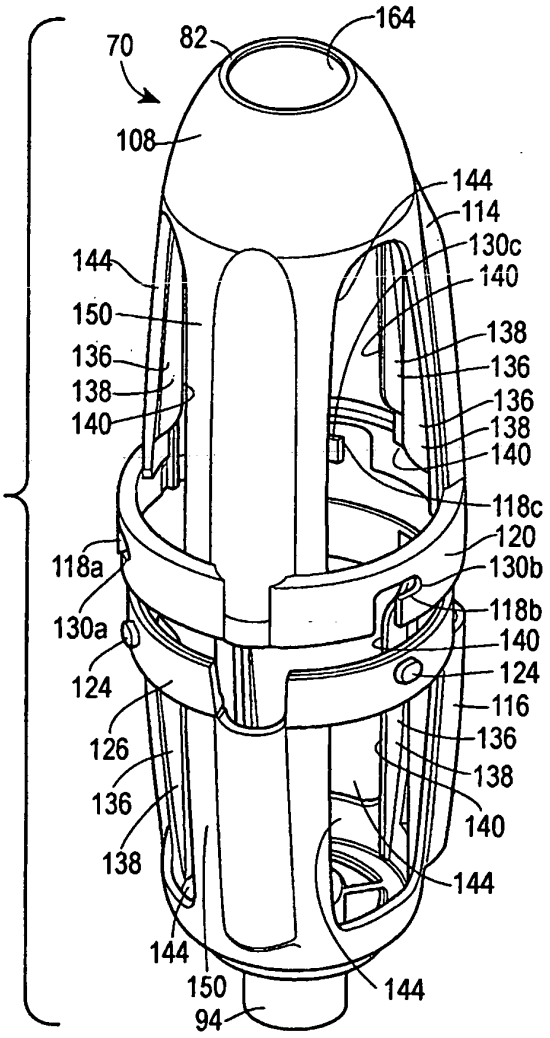

70
82
164
108
144
114
130c
140
144
150
138
136
136
138
136
140
138
140
118c
120
118a
130b
130a
118b
140
124
124
116
126
136
136
138
138
140
144
144
150
144
94

FIG. 3

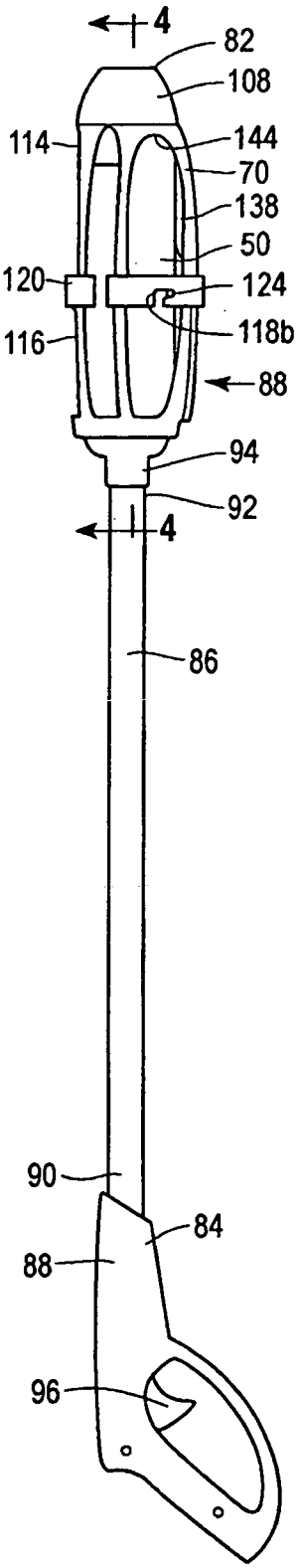

4
82
108
114
144
70
138
50
120
124
116
118b
88
94
92
4
86
90
84
88
96

FIG. 4

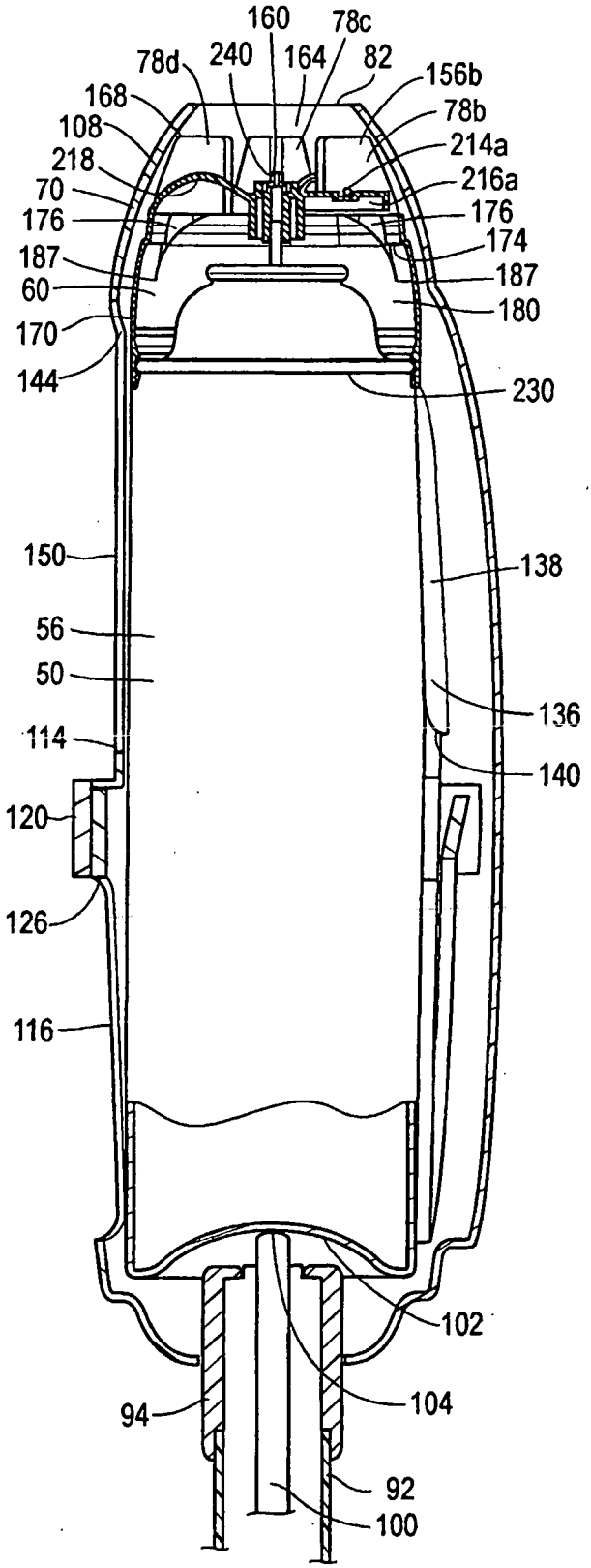

160
78c
78d
240
164
82
156b
168
78b
108
214a
218
216a
70
176
176
174
187
187
60
180
170
230
144
150
138
56
50
136
114
140
120
126
116
102
104
94
92
100

FIG. 6

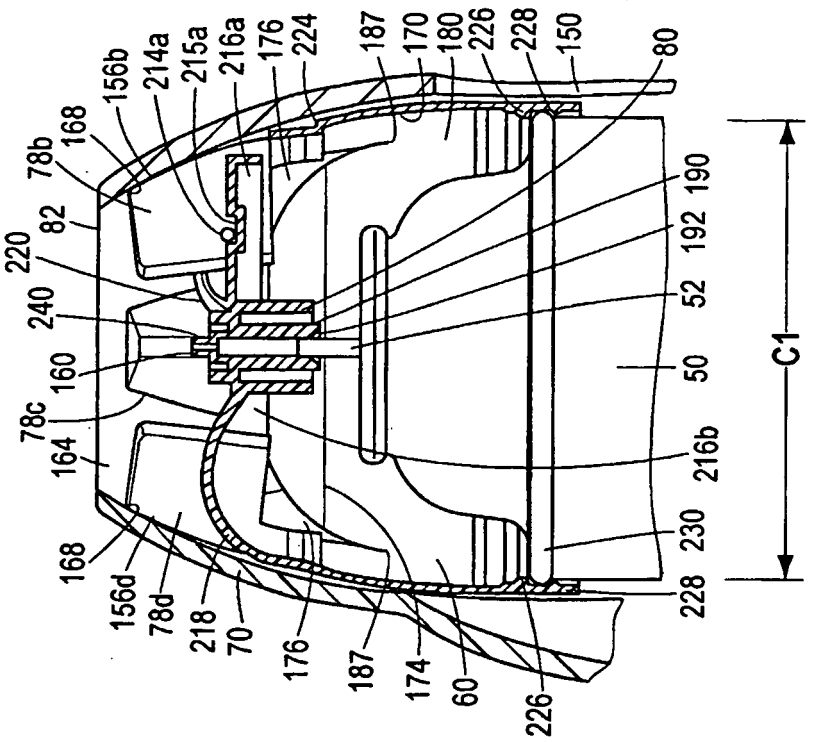

168
78b
82
220
240
160
78c
164
156b
214a
215a
216a
176
224
187
170
180
226
228
150
80
190
192
52
50
216b
230
C1
168
156d
78d
218
70
176
187
174
60
226

FIG. 5

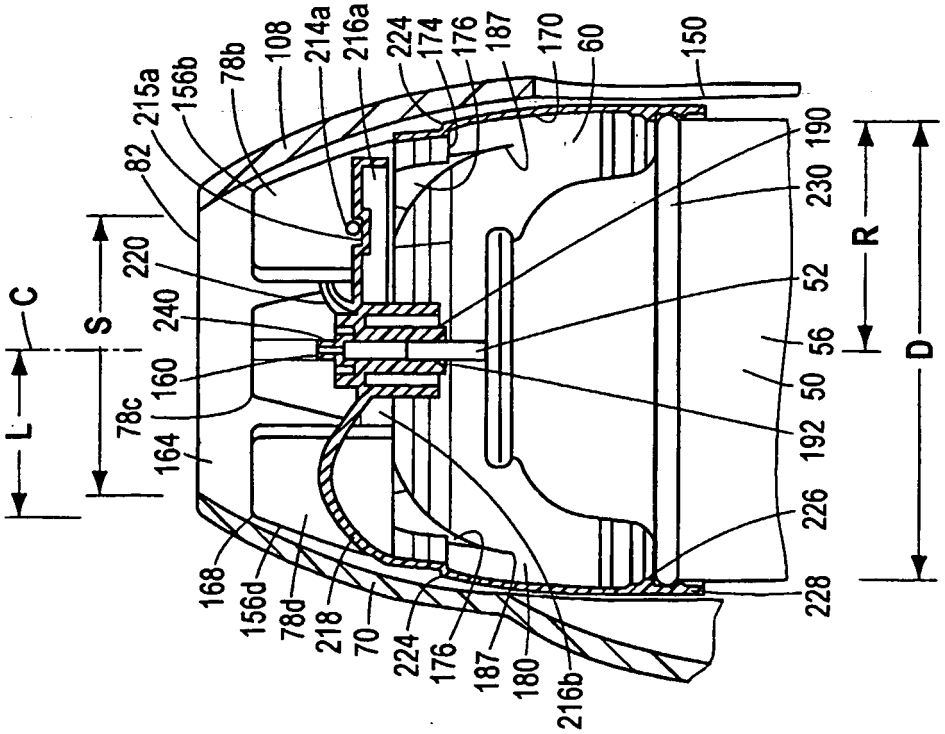

C
L
S
82
220
240
160
78c
164
215a
156b
78b
108
214a
216a
224
174
176
187
170
60
150
190
230
52
56
50
192
226
228
R
D
168
156d
78d
218
70
224
176
187
180
216b

FIG. 7

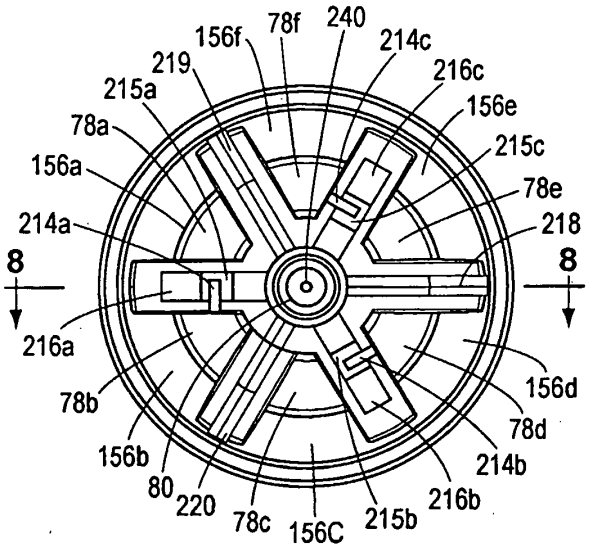


FIG. 8

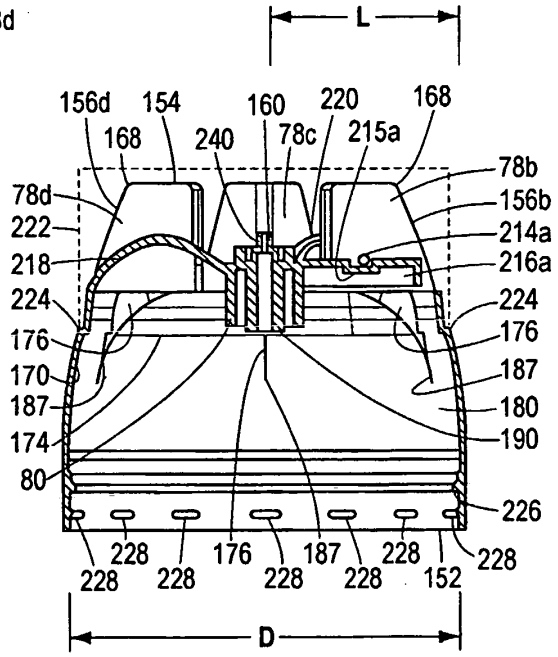


FIG. 9

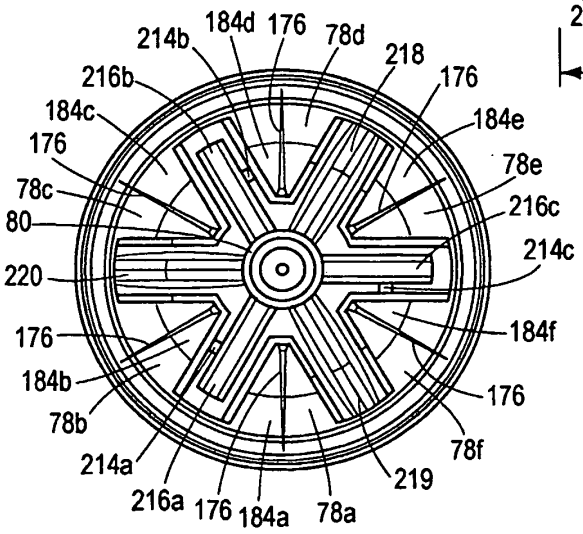


FIG. 10

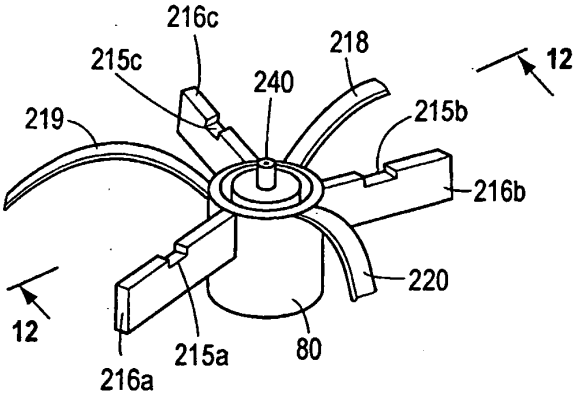


FIG. 11

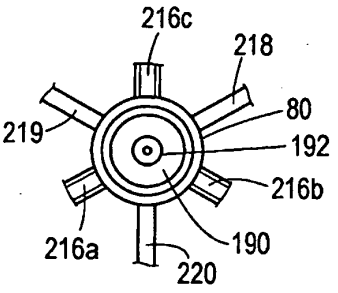


FIG. 12

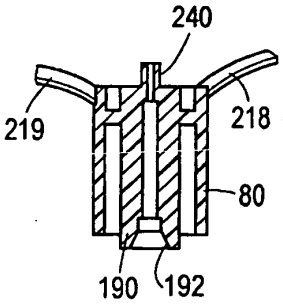


FIG. 13

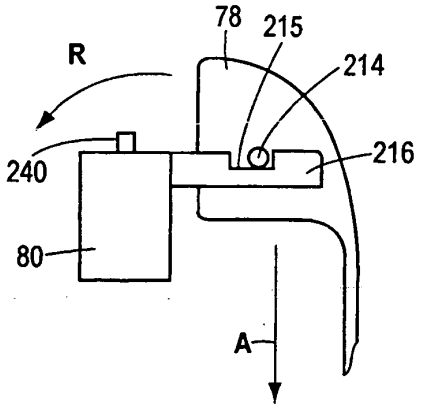


FIG. 12A

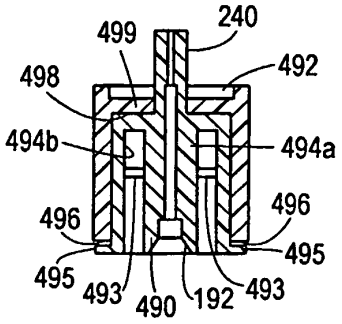


FIG. 14

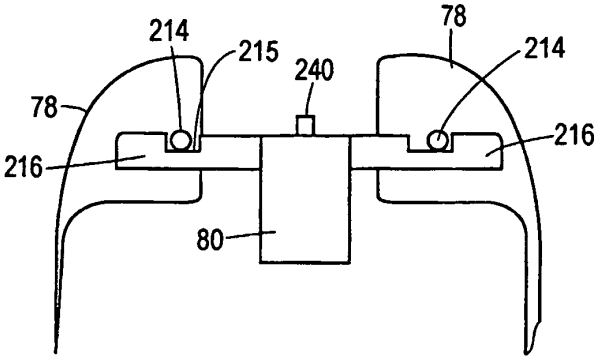
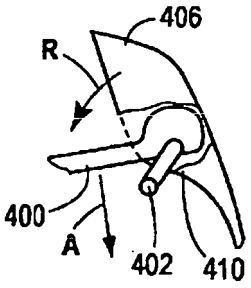


FIG. 15



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