(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 April 2015 (30.04.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/058244 A1

(51) International Patent Classification:
A61J 9/04 (2006.01) *B05B 11/02* (2006.01)
A61J 9/08 (2006.01) *B65D 83/76* (2006.01)

(21) International Application Number:
PCT/AU2014/001002

(22) International Filing Date:
22 October 2014 (22.10.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2013904071 22 October 2013 (22.10.2013) AU
2013101385 22 October 2013 (22.10.2013) AU

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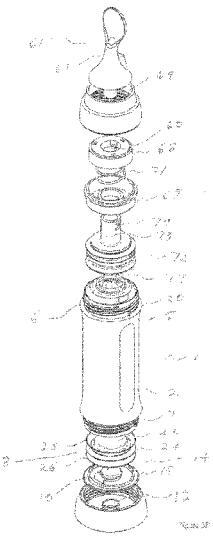
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

(54) **Title**: A DISPENSER



(57) **Abstract**: A kit of parts for a feeder [1] has a body [2] and a bung [8] which can slide within the body [2]. A periphery of the bung [8] can form a sliding seal between that periphery and the internal side walls of the tubular body [2]. A base cap [11] has an aperture [12] through it and is mountable at a lower end [4] of the body [2] to substantially occlude that end [4] and to allow airflow through the aperture [12] into the body [2] as the bung [8] moves away from the lower end [4] of the body [2]. The kit of parts has a teat mouthpiece [9] for liquid foods, a sipper mouthpiece [41] for pureed food and a spout mouthpiece [51] for mashed food and a pump attachment [61]. The pump attachment [61] has a pump and a spoon [63]. The pump has a pump bung [72] which moves reciprocatingly within the body [2] and which forms a sliding seal with the internal side walls of the body [2]. A valve [77] allows food to flow from the feeder [1] but prevents the flow of food into the feeder [1]. A feeder [1] is also disclosed.

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A DISPENSER

Related Applications

[0001] This application claims priority to Australian Provisional Patent Application No. 2013904071 in the name of JAG Mayer Pty Ltd, which was filed on 22 October 2013, entitled "A Dispenser" and to Australian Innovation Patent No. 2013101385 in the name of JAG Mayer Pty Ltd, which was filed on 22 October 2013, entitled "A Dispenser" and the specifications thereof are incorporated herein by reference in their entirety and for all purposes.

Field of the invention

[0002] The present invention relates to bottles and like containers which are suitable for use as feeders. It is particularly suitable for the feeding of infants and of people who are suffering from disabilities, such as, persons who are recovering from facial or dental surgery and the incapacitated elderly, however, it should be appreciated that the present invention is not limited to that use, only. For example, embodiments of the present invention are also suitable for use as dispensers of material other than foods.

Background of the Invention

[0003] Common problems at infant feeding time are the mess created, the wasted food and the time spent cleaning up. There is a need for a re-usable feeding dispenser that is non-spill, easy to fill and easy to clean. Parents also need a container that they can give to toddlers so that they can feed themselves independently.

[0004] Single-use packaging for ready to eat baby foods are accordingly a popular choice for today's parents. A trip down the baby/toddler aisle at the supermarket will confirm this by the sheer numbers of brands and the different types of foods being offered in these packages. Yoghurts, smoothies, fruit jellies, porridge, bolognese, creamy chicken and vegetable purees are just a few of the ready-to-eat meals and snacks that are being offered in these single use packages.

[0005] More recently, re-usable squeezable silicone type containers have entered the marketplace giving parents the option of feeding their children homemade meals in transportable feeding dispensers. However the solution provided by these dispensers is in itself flawed. The inability to empty the entire contents out of these containers is both frustrating and wasteful. Also toddlers are able to create a mess when given these containers by excessively squeezing the food out onto themselves and onto their environment, such as the floor, walls car seats and the like.

[0006] It is an object of the embodiments described herein to overcome or alleviate at least one of the above noted drawbacks of related art systems or to at least provide a useful alternative to related art systems.

Summary of the Invention

[0007] In contrast to any related or prior art noted herein, in one aspect, embodiments of the present invention provide a kit of parts for a dispenser of material, comprising:

a tubular body of substantially invariant internal cross-sectional shape;

a bung which:

is adapted to slide within the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and the internal side walls of the tubular body; and

a base cap having an aperture through it, the base cap being adapted:

for mounting at a first end of the tubular body so as to substantially occlude that end; and

to allow airflow through the aperture into the tubular body as the bung moves in a direction away from the first end of the tubular body.

[0008] It is preferred that the material is food or drink.

[0009] It is preferred that the kit of parts further comprise at least one mouthpiece attachment which is adapted for readily-detachable mounting to a second end of the tubular body.

[0010] It is preferred that the kit of parts further comprise a pump attachment, the pump attachment comprising a pump which is adapted for readily-detachable mounting to the second end of the tubular body and which is adapted to pump material out of the tubular body.

[0011] It is preferred that the pump attachment further comprise a spoon which is mounted on the pump attachment and which is adapted to receive material which the pump pumps out of the tubular body.

[0012] It is preferred that the kit of parts further comprise a top cap which is mountable to the dispenser to cover at least one of a mouthpiece attachment and the pump attachment.

[0013] It is preferred that the kit of parts further comprise a valve which is mountable in the dispenser to permit airflow only in the direction from the exterior of the tubular body to the interior of the tubular body.

[0014] It is preferred that the kit of parts further comprise a valve which is mountable at the second end of the tubular body so as to permit the flow of material only in the direction from the interior of the tubular body to the exterior of the tubular body.

[0015] It is preferred that the valve to permit the flow of material only in the direction from the interior of the tubular body is weaker than is the valve to permit airflow only in the direction from the exterior of the tubular body.

[0016] It is preferred that the tubular body is substantially circular in internal cross-section.

[0017] It is preferred that the periphery which is adapted to form the sliding seal comprises at least one of:

a radially-extending circumferential seal;

a radially-extending scraping and sealing blade; and

a radially-extending locating and alignment ring which is located between the

radially-extending circumferential seal and the radially-extending locating and alignment ring.

[0018] It is preferred that the radially-extending circumferential seal is formed separately from the bung.

[0019] It is preferred that at least one of:

the radially-extending scraping and sealing blade; and

the radially-extending locating and alignment ring

is formed integrally with the bung.

[0020] It is preferred that the base cap is adapted to serve as a mounting for the top cap so as not to substantially occlude the airflow through the aperture into the tubular body.

[0021] It is preferred that the base cap comprises:

a central body, the periphery of which carries longitudinally-running channels; and

an outer peripheral skirt which surrounds the periphery of the central body,

the base cap being adapted to receive a peripheral edge of the top cap between the longitudinally-running channels and the outer peripheral skirt.

[0022] It is preferred that the at least one mouthpiece attachment is one of:

a teat mouthpiece which is adapted to allow the flow of a liquid through it;

a sipper mouthpiece which is adapted to allow the flow of pureed material through it; and

a spout mouthpiece which is adapted to allow the flow of mashed material through it.

[0023] It is preferred that the sipper mouthpiece comprises a body which has a blunt end which is pierced by a slit in that blunt end.

[0024] It is preferred that the body of the sipper mouthpiece is substantially elliptical in cross-section.

[0025] It is preferred that the spout mouthpiece comprises:

a base;

an open-ended spout which extends from the base; and

a valve in the base which allows flow of material into the spout.

[0026] It is preferred that the pump comprises:

a pump bung which:

is adapted for reciprocating movement along the longitudinal axis of the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and the internal side walls of the tubular body;

a valve which is adapted to allow the flow of material from the interior of the tubular body as the pump bung moves into the pump body but to prevent the flow of material into the interior of the tubular body as the pump bung moves out of the pump body; and

biasing means to bias the pump bung to move in a direction out of the pump body.

[0027] It is preferred that the biasing means comprises a helical spring.

[0028] It is preferred that the helical spring is mounted in a housing which comprises:

a spring stop relative to which the pump bung is longitudinally moveable; and

a spring top cap:

relative to which the pump bung is fixed; and

which is reciprocally moveable within the spring stop.

[0029] It is preferred that the pump attachment further comprises a pump tube which is adapted to deliver material from the outlet of the a valve which is adapted to allow the flow of material from the interior of the tubular body to the spoon.

[0030] It is preferred that the spring stop and the spring top cap are mounted substantially co-axially around the pump tube.

[0031] In another aspect, embodiments of the present invention provide a dispenser for the dispensing of material, the dispenser being assembled from the kit of parts which is summarized above.

[0032] In another aspect, embodiments of the present invention provide a pump attachment for a dispenser of material comprising a pump which is adapted for mounting to the dispenser, the dispenser comprising a tubular body, the pump attachment being adapted to pump material out of the dispenser.

[0033] It is preferred that the pump attachment further comprise a spoon which is mounted on the pump attachment and which is adapted to receive material which the pump pumps out of the dispenser.

[0034] It is preferred that the pump comprises:

a pump bung which:

is adapted for reciprocating movement along a longitudinal axis of the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and internal side walls of the tubular body;

a valve which is adapted to allow the flow of material from the interior of the tubular body as the pump bung moves into the tubular body but to prevent the flow of material into the interior of the tubular body as the pump bung moves out of the tubular body; and

biasing means to bias the pump bung to move in a direction out of the tubular body.

[0035] It is preferred that the biasing means comprises a helical spring.

[0036] It is preferred that the helical spring is mounted in a housing which comprises:

a spring stop relative to which the pump bung is longitudinally moveable; and

a spring top cap:

relative to which the pump bung is fixed; and

which is reciprocally moveable within the spring stop.

[0037] It is preferred that the pump attachment further comprises a pump tube which is adapted to deliver material from the outlet of the a valve which is adapted to allow the flow of material from the interior of the tubular body to the spoon.

[0038] It is preferred that the spring stop and the spring top cap are mounted substantially co-axially around the pump tube.

[0039] It will be seen that embodiments of the present invention provide a non-squeezable re-usable feeding dispenser, which offers the same benefits as the squeezable dispensers as well as solutions to common wastage problems such as: toddlers excessively squeezing contents from flexible dispensers, the inability to get all of the contents out of the dispensers and spoons and/or bowls being knocked to the floor.

Brief description of the drawings

[0040] For a better understanding of the invention, and to show how it may be carried into effect, embodiments of it are shown, by way of non-limiting example only, in the accompanying drawings. In the drawings:

Figure 1A is an elevational view of an embodiment of the invention;

Figure 1B is a cross-sectional view of the embodiment of figure 1A;

Figures 1C and 1E are elevational views of preferred forms of the embodiment of figure 1A;

Figure 1D is a cross-sectional view of the embodiment of figure 1C;

Figure 1F is an exploded view of the embodiment of figure 1A;

Figure 1G is a top view of the embodiment of figure 1A;

Figure 1H is a view from below of the embodiment of figure 1A;

Figure 2A is an elevational view of an embodiment of the invention;

Figure 2B is a cross-sectional view of the embodiment of figure 2A;

Figure 2C is an exploded view of the embodiment of figure 2A;

Figure 3A is an elevational view of an embodiment of the invention;

Figure 3B is a cross-sectional view of the embodiment of figure 3A;

Figures 3C and 3E are elevational views of preferred forms of the embodiment of

figure 3A;

Figure 3D is a cross-sectional view of the embodiment of figure 3C;

Figure 3F is an exploded view of the embodiment of figure 3A;

Figure 3G is a top view of the embodiment of figure 3A;

Figure 4A is an elevational view of an embodiment of the invention;

Figure 4B is a cross-sectional view of the embodiment of figure 4A;

Figures 4C and 4E are elevational views of preferred forms of the embodiment of figure 4A;

Figure 4D is a cross-sectional view of the embodiment of figure 4C;

Figure 4F is an exploded view of the embodiment of figure 4A;

Figure 4G is a top view of the embodiment of figure 4A;

Figure 5A is an elevational view of an embodiment of the invention;

Figure 5B is a cross-sectional view of the embodiment of figure 5A;

Figures 5C and 5E are elevational views of preferred forms of the embodiment of figure 5A;

Figure 5D is a cross-sectional view of the embodiment of figure 5C;

Figure 5F is an exploded view of the embodiment of figure 5A;

Figure 5G is a top view of the embodiment of figure 5A;

Figures 6A and 6B are cross-sectional views illustrating aspects of the operation of the embodiment of figure 5A;

Figure 7A is an elevational view of an embodiment of the invention;

Figure 7B is a cross-sectional view of the embodiment of figure 7A;

Figure 7C is an exploded view of the embodiment of figure 7A; and

Figure 7D is a top view of the embodiment of figure 7A.

Description of preferred embodiments of the invention

[0041] The embodiments of the feeder 1 that are illustrated in figures 1A to 1G comprise: a base cap 11, a valve carrier 14, a movable bung 8, a tube 2, a teat mouthpiece 9 and an upper collar 19.

[0042] Although the tube 2 of figures 1A to 1F is circular in cross-section, it may have any cross-section, so long as that cross-section is substantially constant throughout its

entire length. The tube 2 has upper and lower open ends 3 and 4 and carries screw threads 6 and 7 adjacent those upper and lower ends. Although the screw threads 6 and 7 of figures 1A to 1G are external to the tube 2, those screw threads may be internal to the tube 2. An over-moulding 5 encases a substantial portion of the exterior surface of the tube 2 between the upper and lower screw threads 6 and 7. The lower end of the upper screw thread 6 terminates in a thread stop 20 to aid in the orientation of components which are mounted on that screw thread.

[0043] The tube 2 of figures 1A to 1F is symmetrical, in the sense that the screw threads 6 and 7 are identical. According to alternative embodiments of the invention which are not illustrated in the drawings, the feeder 1 is constructed so that it is not symmetrical in this sense so that the user may identify different "top" and "bottom" ends. The identification of different "top" and "bottom" ends of the tube 2 is useful in the case where the tube 2 is marked with a scale to indicate the volume of the contents of the feeder 1.

[0044] The moveable bung 8 is moveable longitudinally within the tube 2 and comprises a top 22, an upper blade 23, an intermediate blade 24 and a lower blade 26. Each of the blades 23, 24 and 26 extends around the periphery of the bung 8 and extends radially from the bung 8. The tolerances between the movable bung 8 and the inner surface of the tube 2 are such as to form a sliding seal between the movable bung 8 and the tube 2. The movable bung 8 is preferably constructed of a plastics polymer with a rubber over-mould to create a seal and to provide friction with the tube 2. This friction helps to support the movable bung 8 from moving downward. The top 22 of the movable bung 8 is shaped substantially to complement the underside of the teat mouthpiece 9. This helps to reduce the amount of contents left in the tube 2 when the movable bung 9 has reached the top of the tube 2 and is resting hard up against the underside of the mouthpiece 9. The blades 23, 24 and 26 around the movable bung 8 scrape along the inside wall of the tube 2 as the movable bung 8 moves up towards the mouthpiece 9, leaving virtually none of the contents behind.

[0045] A base cap 11 is mounted at the lower open end 4 of the tube 2 and prevents the movement of the bung 8 out of that end. For this purpose the base cap 11 carries an

internal screw thread 18 which matches the external screw thread 7 of the tube 2. The base cap 11 is pierced by a an air hole 12.

[0046] The base cap 11 also retains a valve carrier 14 in place over the lower open end 4 of the tube 2. The valve carrier 14 has a peripheral region 15, a valve 16 and a pull-tab 10. Preferred forms of the valve 16 include a "dome valve" and a "sphere valve". As is illustrated in the drawings, a dome valve (such as valve 16 as is illustrated in the drawings) comprises a dome portion the periphery of which is contiguous with a cylindrical portion. A sphere valve is not illustrated in the drawings but it comprises a portion which is substantially more than half of a hollow sphere, the periphery of which is contiguous with a cylindrical portion. A dome valve accordingly has a shallower shape compared to the spherical valve. The functional difference between the two valves is that the spherical valve is significantly stronger than is the dome valve with regards to back pressure.

[0047] The valve 16 is in alignment with the air hole 12 in the base cap 11. It permits the ready flow of air from the exterior of tube 2 into the interior of that tube and substantially prevents the flow of air in the opposite direction. The air is then trapped in the tube 2 by the one-way valve 16, keeping the bung 8 in place by not allowing it to fall downward. The pull-tab 10 enables easy removal of the valve carrier 14, such as for cleaning. As is shown if figure 1H, the base cap 11 comprises an outer peripheral skirt 25 which surrounds the periphery of a central body 30. The periphery of the central body 30 is formed into longitudinally-running channels 17.

[0048] An upper collar 19 has an internal screw thread 21 which matches the external screw thread 6 of the tube 2. The upper collar 19 retains a teat mouthpiece 9 in place over the upper open end 3 of the tube 2. The teat mouthpiece 9 has a teat 27 which projects outwardly from the mouthpiece base 28 and the peripheral area of the base 28 is gripped between the tube 2 and the upper collar 19. The teat 27 is pierced or slit in the known manner of teats for baby feeding bottles.

[0049] As is illustrated in figures 1C, 1D and 1E, it is preferred to provide a cap 31 which can be placed over the teat mouthpiece 9 for protection and to aid in the prevention of spillages. A substantially cylindrical protrusion 32 depends from the inner top surface

of the cap 31 to hold an upper region of the teat 27. The cylindrical protrusion 32 seals off around the teat to reduce the risk of the spillage of material from the teat. The cap 31 is detachably held in place by being an interference fit over the upper collar 19. As is illustrated in figure 1E, the cap 31 can be stored adjacent the lower end 4 of the tube 2 by retention between the outer skirt 25 and the central body 30 of the base cap 11. The channels 17 in the central body 30 allow air to flow from the exterior, around the edge of the cap 31 and through the air hole 12 into the tube 2.

[0050] As is illustrated in figures 2A to 2C, it is preferred to provide a funnel 34 to aid in the loading of material into the feeder 1. The funnel 34 has a handle 36 which protrudes from the upper periphery of the funnel. It is preferred that the stem 37 of the funnel be a close fit within the upper open end 3 of the tube 2.

[0051] The embodiments of the invention that are illustrated in figures 3A to 3G differ from the embodiments of figures 1A to 1G in that the teat mouthpiece 9 has been replaced by a sipper mouthpiece 41. The sipper mouthpiece 41 is hollow and comprises a base 42 from which extends a sipper body 43 which is preferably substantially elliptical in cross-section and which terminates in a blunt end 44. The blunt end 44 is pierced by a slit 46 which extends across an axis of that end and operates in the same manner as do teats for baby feeding bottles.

[0052] The embodiments of the invention that are illustrated in figures 4A to 4G differ from the embodiments of figures 1A to 1G in that the teat mouthpiece 9 has been replaced by a spout mouthpiece 51. The spout mouthpiece 51 comprises an open-ended spout 53 which extends upwardly from a base 52. A valve 54 in the base 52 allows for one-way flow of material from the tube 2 into the spout 53. The purpose the valve 54 is to prevent contents of the feeder 1 from spilling out when the feeder is on its side or upside down. This valve is designed to be weaker than the one-way air valve 16 located in the movable bung 8, to enable the contents of the feeder 1 to dispense smoothly.

[0053] The embodiments of the invention that are illustrated in figures 5A to 5G differ from the embodiments of figures 1A to 1G in that the teat mouthpiece 9 has been replaced by a spoon pump attachment 61.

[0054] The spoon pump attachment 61 allows parents to feed their infants single-handedly, whilst also promoting utensil education for the infant.

[0055] The spoon pump attachment 61 comprises a spoon 63 and a pump. The pump is dimensioned to dispense just enough contents to fill the spoon 63. The spoon 63 comprises a spoon head 68 and a spoon tube 64 so that the spoon head 68 is in communication with the hollow interior of the spoon tube 64. A spoon trigger 67 projects substantially radially from the spoon tube 64. The pump comprises the top cap pump pack 68, the helical spring 71, the pump bung 72 and the pump one way valve 77. The structure and function of the various components of the of the spoon pump attachment are as follows

Spoon top cap 62

[0056] A spoon top cap 62 snap fits onto the feeder 1, protecting the spoon 63 when it is not in use. It can also be clipped into the base cap 11 during use.

Spoon 63

[0057] The spoon 63 clips onto the top cap pump pack 68. It has a tube 64 that fits into the pump bung 72 and opens onto the spoon head 66. The contents of the feeder 1 will travel through the tube 64 onto the spoon head 66. Underneath the tube 64 at the back of the spoon head 66 is the spoon trigger 67 where the user applies pressure to engage the pump mechanism.

Top cap pump pack 68

[0058] A top cap pump pack 68 is fitted to the pump bung 72 with a quick release bayonet fitting. The bayonet fitting comprises the bayonet slots 74 in the pump bung tube 73 and corresponding projections 60 within the top cap pump pack 68. Together with the spring stop 69 it houses the spring 71. The top of the pump bung 72 and the tube 64 of the spoon run through the middle of the top cap pump pack 68, spring 71 and spring stop 69.

Spring 71

[0059] The coil spring 71 is fitted to the spring stop 69 and housed in the top cap pump pack 68. Its purpose is to return the spoon 63, top cap pump pack 68 and pump bung 72 back to its original position.

Spring Stop 69

[0060] The spring stop 69 is fastened to the feeder tube 2 by the pump collar 68. Its purpose is to house the spring 71 and attach the pump mechanism to the tube 2.

Pump Collar 78

[0061] The threaded pump collar 78 fastens the spoon pump attachment 61 to the tube 2. It has an extended collar that reaches above the top cap pump pack 68 to the base of the spoon attachment 61 in order to protect the user from pinching skin when pumping the spoon attachment 61.

Pump Bung 72

[0062] The top of the pump bung 72 is a tube 73 that attaches to the top cap pump pack 68. The tube 64 of the spoon fits into the tube 73 at the top of the pump bung 72. The pump one-way valve 77 clips into the base of the pump bung tube 73. The pump bung 72 comprises a body 75 which receives a radially-extending circumferential seal 76. The outer periphery of the seal 76 forms a sliding seal with the internal wall of the tube 2. A radially-extending location/alignment ring 79 is integrally formed with the body 75 below the circumferential seal 76 and a radially extending scraper/seal blade 80 is integrally formed with the body 75 below the location/alignment ring 79. The circumferential seal 76, the location/alignment ring 79 and the scraper/seal blade 80 result in the pump bung 72 fitting tightly within, and sealing with, the tube 2.

[0063] When downward pressure is applied to the spoon trigger 67, the pump bung 72 will move downward inside the feeder tube 2. The contents will be force to squeeze through the pump one way-valve 77 out through the spoon tube 64 onto the spoon head 66.

Pump One-way Valve 77

[0064] The pump one way valve 77 clips into the base of the pump bung tube 73. The pump one way valve 77 allows the contents of the feeder 2 to squeeze out onto the spoon 63, but will not allow the contents to be sucked back into the tube 2. The pump one way valve 77 is designed to be weaker than the one way valve 16 which is fitted at the bottom of the feeder. This will allow a smoother feed of the contents dispensing, rather than a squirt.

[0065] The embodiments of the invention that are illustrated in figures 7A to 7D differ from the embodiments of figures 1A to 1G in that the teat mouthpiece 9 has been replaced by a storage cap 81. The storage cap 81 fits onto the top of the tube 2 and is held in place by the upper collar 19. The storage cap 81 is intended for use on the tops of spare feeders and for the storage of feeders during travel or in refrigerators or in coolers.

[0066] The different mouthpieces are designed to accommodate different textures of materials. The teat mouthpiece 9 accommodates liquids, such as milk, water and juices. The sipper mouthpiece 41 accommodates purees, such as pureed vegetables, fruits, cereals, smoothies and yoghurt. The spout mouthpiece 51 accommodates mashes, such as mashed vegetables, fruits, proteins, and chunky soups.

[0067] The spoon pump attachment is designed to allow parents to feed their infants single-handedly, while also promoting utensil education for the infant. The spring-loaded pump is regulated to dispense just enough contents to fill the attached spoon.

[0068] The presently-described embodiments of the invention are manufactured in any suitable material by any suitable process, but particularly preferred materials and processes for various components are set out in the following table.

Component	Process	Material
1 Tube 2	Injection moulding	Tritan copolyester
2 Over-moulding 5	Over moulding	ABS (Acrylonitrile butadiene styrene)

3 Bung 8	Injection moulding	Polyurethane
4 Teat 9	Injection moulding	Silicones
5 Base cap 11	Injection moulding	ABS
6 Valve 16	Injection moulding	Polyurethane
7 Collar 19	Injection moulding	ABS
10 Top cap 31	Injection moulding	Tritan copolyester
11 Funnel 34	Injection moulding	ABS
12 Sipper mouthpiece 41	Injection moulding	Polyurethane
13 Spout mouthpiece 51	Over moulding	Polyurethane
14 Spoon 63	Injection moulding	Polyurethane
15 Spring stop 15	Injection moulding	ABS
16 Pump Bung 72	Injection moulding	HDPE (high-density polyethylene)
17 Pump one-way valve 77	Injection moulding	Polyurethane
18 Pump collar 78	Injection moulding	ABS
19 Storage cap	Injection moulding	ABS

[0069] While the present invention has been described with reference to a few specific embodiments, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications may occur to those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims. As the present invention may be embodied in several forms without departing from the spirit of the essential characteristics of the invention, it should be understood that the above described embodiments are not to limit the present invention unless otherwise specified, but rather should be construed broadly within the spirit and scope of the invention as defined in the appended claims. The described embodiments are to be considered in all respects as illustrative only and not restrictive. Various modifications and equivalent arrangements are intended to be included within the spirit and scope of the invention and appended claims. Therefore, the specific embodiments are to be understood to be illustrative of the many ways in which the principles of the present invention may be practiced. In the following claims, any particular means-plus-function clauses are intended to cover structures as performing the defined function and not only structural

equivalents, but also equivalent structures. For example, although a nail and a screw may not be structural equivalents in that a nail employs a cylindrical surface to secure wooden parts together, whereas a screw employs a helical surface to secure wooden parts together, in the environment of fastening wooden parts, a nail and a screw are equivalent structures.

[0070] A reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that the referenced prior art forms part of the common general knowledge in Australia. Accordingly, it is to be appreciated that any discussion of documents, devices, acts or knowledge in this specification is included to explain the context of the present invention. Further, the discussion throughout this specification comes about due to the realisation of the inventor and/or the identification of certain related art problems by the inventor. Moreover, any discussion of material such as documents, devices, acts or knowledge in this specification is included to explain the context of the invention in terms of the inventor's knowledge and experience and, accordingly, any such discussion should not be taken as an admission that any of the material forms part of the prior art base or the common general knowledge in the relevant art in Australia, or elsewhere, on or before the priority date of the disclosure and claims herein.

[0071] Throughout this specification the use of the word "inventor" in singular form may be taken as reference to one (singular) inventor or more than one (plural) inventor of the present invention.

[0072] Throughout this specification, the words "comprise", "comprised", "comprising" and "comprises" are to be taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

[0073] In the claims, each dependent claim is to be read as being within the scope of its parent claim or claims, in the sense that a dependent claim is not to be interpreted as infringed unless its parent claims are also infringed.

Claims

1. A kit of parts for a dispenser of material, comprising:

a tubular body of substantially invariant internal cross-sectional shape;

a bung which:

is adapted to slide within the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and the internal side walls of the tubular body; and

a base cap having an aperture through it, the base cap being adapted:

for mounting at a first end of the tubular body so as to substantially occlude that end; and

to allow airflow through the aperture into the tubular body as the bung moves in a direction away from the first end of the tubular body.

2. A kit of parts as claimed in claim 1, in which the material is food or drink.

3. A kit of parts as claimed in claim 1 or claim 2, further comprising at least one mouthpiece attachment which is adapted for readily-detachable mounting to a second end of the tubular body.

4. A kit of parts as claimed in any one of the preceding claims, further comprising a pump attachment, the pump attachment comprising a pump which is adapted for readily-detachable mounting to the second end of the tubular body and which is adapted to pump material out of the tubular body.

5. A kit of parts as claimed in claim 5, in which the pump attachment further comprises a spoon which is mounted on the pump attachment and which is adapted to receive material which the pump pumps out of the tubular body.

6. A kit of parts as claimed in any one of the preceding claims, further comprising a top cap which is mountable to the dispenser to cover at least one of a mouthpiece attachment and the pump attachment.

7. A kit of parts as claimed in any one of the preceding claims, further comprising a valve which is mountable in the dispenser to permit airflow only in the direction from the exterior of the tubular body to the interior of the tubular body.

8. A kit of parts as claimed in any one of the preceding claims, further comprising a valve which is mountable at the second end of the tubular body so as to permit the flow of material only in the direction from the interior of the tubular body to the exterior of the tubular body.

9. A kit of parts as claimed in claim 8 in which the valve to permit the flow of material only in the direction from the interior of the tubular body is weaker than is the valve to permit airflow only in the direction from the exterior of the tubular body.

10. A kit of parts as claimed in any one of the preceding claims, in which the tubular body is substantially circular in internal cross-section.

11. A kit of parts as claimed any one of the preceding claims, in which the periphery which is adapted to form the sliding seal comprises at least one of:

a radially-extending circumferential seal;

a radially-extending scraping and sealing blade; and

a radially-extending locating and alignment ring which is located between the radially-extending circumferential seal and the radially-extending locating and alignment ring.

12. A kit of parts as claimed in claim 11, in which the radially-extending circumferential seal is formed separately from the bung.

13. A kit of parts as claimed in claim 11 or claim 12, in which at least one of

the radially-extending scraping and sealing blade; and

the radially-extending locating and alignment ring,

is formed integrally with the bung.

14. A kit of parts as claimed in any one of claims 6 to 13, in which the base cap is adapted to serve as a mounting for the top cap so as not to substantially occlude the airflow through the aperture into the tubular body.

15. A kit of parts as claimed in claim 14, in which the base cap comprises:

a central body, the periphery of which carries longitudinally-running channels; and

an outer peripheral skirt which surrounds the periphery of the central body, the base cap being adapted to receive a peripheral edge of the top cap between the longitudinally-running channels and the outer peripheral skirt.

16. A kit of parts as claimed in any one of claims 3 to 15, in which the at least one mouthpiece attachment is one of:

a teat mouthpiece which is adapted to allow the flow of a liquid through it;

a sipper mouthpiece which is adapted to allow the flow of pureed material through it; and

a spout mouthpiece which is adapted to allow the flow of mashed material through it.

17. A kit of parts as claimed in claim 16, in which the sipper mouthpiece comprises a body which has a blunt end which is pierced by a slit in that blunt end.

18. A kit of parts as claimed in claim 17 in which the body of the sipper mouthpiece is substantially elliptical in cross-section.

19. A kit of parts as claimed in claim 16, in which the spout mouthpiece comprises:

a base;

an open-ended spout which extends from the base; and

a valve in the base which allows flow of material into the spout.

20. A kit of parts as claimed in any one of claims 4 to 19, in which the pump comprises:

a pump bung which:

is adapted for reciprocating movement along the longitudinal axis of the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and the internal side walls of the tubular body;

a valve which is adapted to allow the flow of material from the interior of the tubular body as the pump bung moves into the pump body but to prevent the flow of material into the interior of the tubular body as the pump bung moves out of the pump body; and

biasing means to bias the pump bung to move in a direction out of the pump body.

21. A kit of parts as claimed in claim 20, in which the biasing means comprises a helical spring.

22. A kit of parts as claimed in claim 21, in which the helical spring is mounted in a housing which comprises:

a spring stop relative to which the pump bung is longitudinally moveable; and

a spring top cap:

relative to which the pump bung is fixed; and

which is reciprocally moveable within the spring stop.

23. A kit of parts as claimed in any one of claims 20 to 22, in which the pump attachment further comprises a pump tube which is adapted to deliver material from the outlet of the valve which is adapted to allow the flow of material from the interior of the tubular body to the spoon.

24. A kit of parts as claimed in claim 23 in which the spring stop and the spring top cap are mounted substantially co-axially around the pump tube.

25. A dispenser of material, assembled from the kit of parts which is claimed in any one of claims 1 to 24.

26. A pump attachment for a dispenser of material comprising a pump which is adapted for mounting to the dispenser, the dispenser comprising a tubular body, the pump attachment being adapted to pump material out of the dispenser.

27. A pump attachment for a dispenser as claimed in claim 26, further comprising a spoon which is mounted on the pump attachment and which is adapted to receive material which the pump pumps out of the dispenser.

28. A pump attachment for a dispenser as claimed in claim 26 or claim 27, in which the pump comprises:

a pump bung which:

is adapted for reciprocating movement along a longitudinal axis of the tubular body; and

has a periphery which is adapted to form a sliding seal between that periphery and internal side walls of the tubular body;

a valve which is adapted to allow the flow of material from the interior of the tubular body as the pump bung moves into the tubular body but to prevent the flow of material into the interior of the tubular body as the pump bung moves out of the tubular body; and

biasing means to bias the pump bung to move in a direction out of the tubular body.

29. A pump attachment for a dispenser as claimed in claim 28, in which the biasing means comprises a helical spring.

30. A pump attachment for a dispenser as claimed in claim 29, in which the helical spring is mounted in a housing which comprises:

a spring stop relative to which the pump bung is longitudinally moveable; and

a spring top cap:

relative to which the pump bung is fixed; and

which is reciprocally moveable within the spring stop.

31. A pump attachment for a dispenser as claimed in any one of claims 26 to 30, in which the pump attachment further comprises a pump tube which is adapted to deliver material from the outlet of the a valve which is adapted to allow the flow of material from the interior of the tubular body to the spoon.

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32. A pump attachment for a dispenser as claimed in claim 31, in which the spring stop and the spring top cap are mounted substantially co-axially around the pump tube.

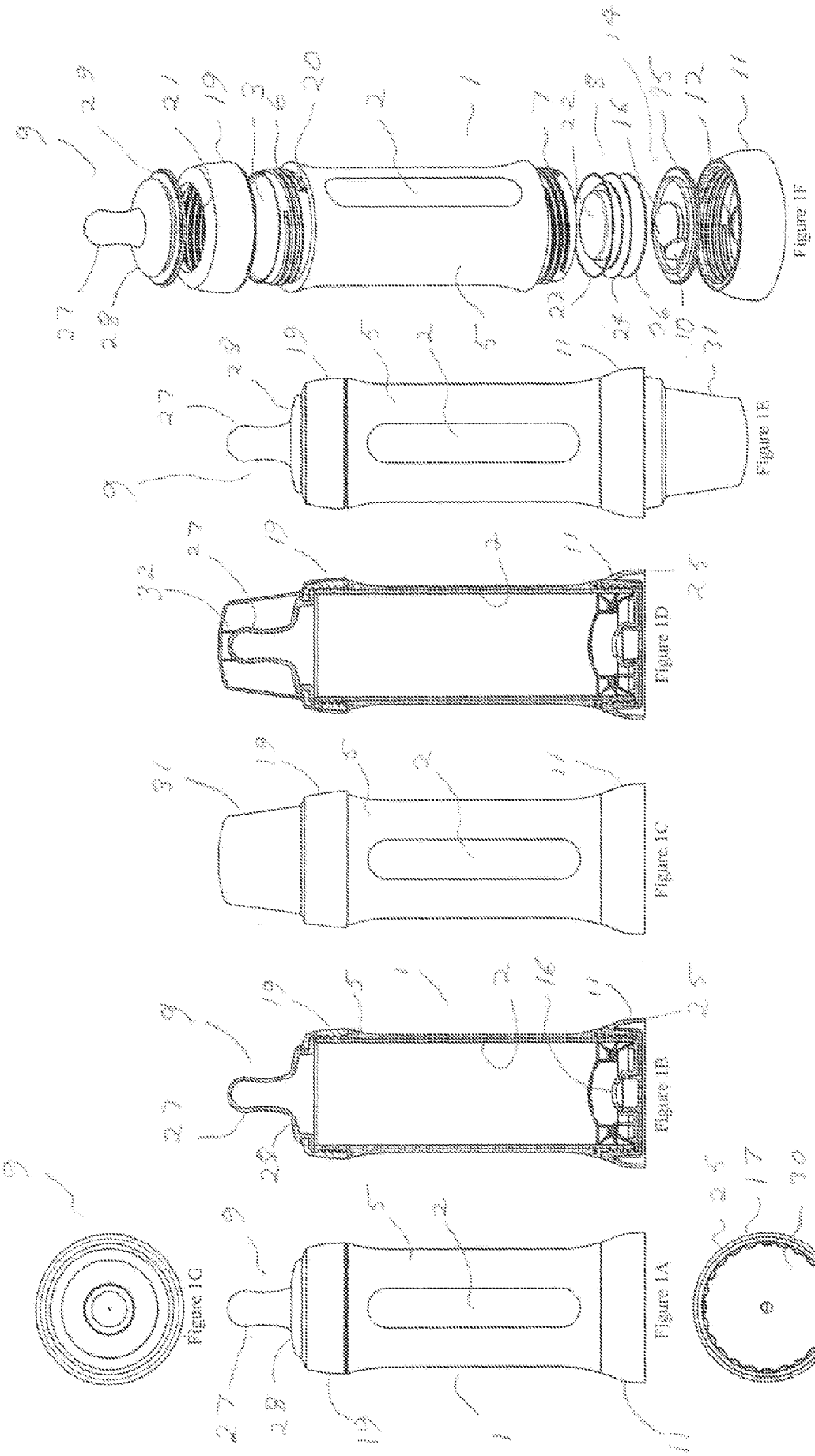
Figure 1F
Figure 1B
Figure 1D
Figure 1C
Figure 1B
Figure 1G
Figure 1A
Figure 1H

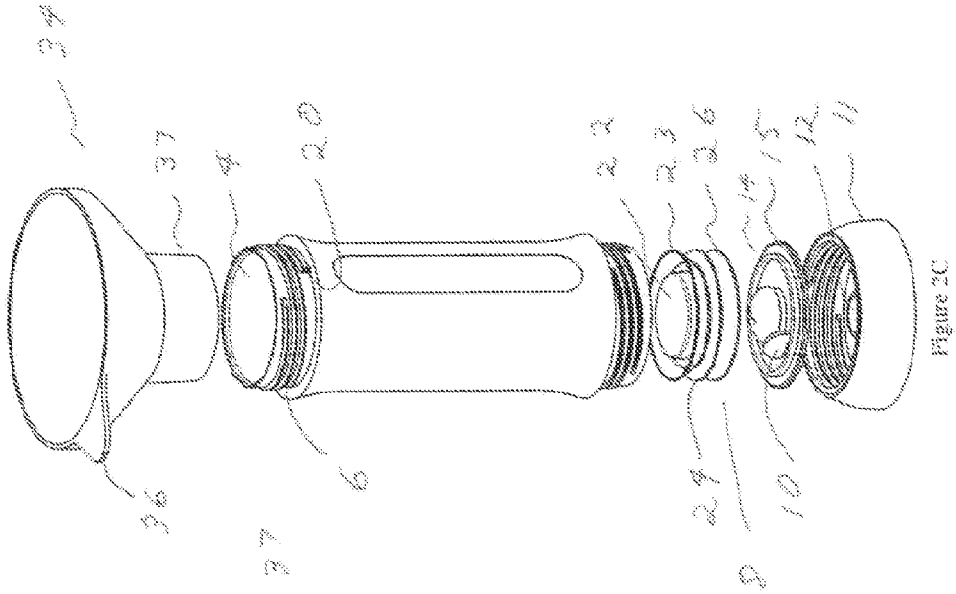

Figure 2C

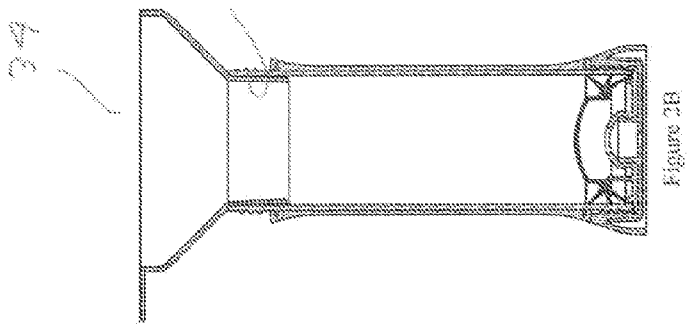

Figure 2B

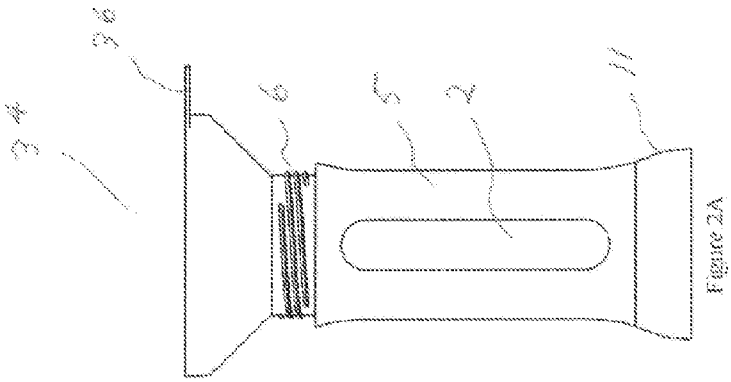

Figure 2A

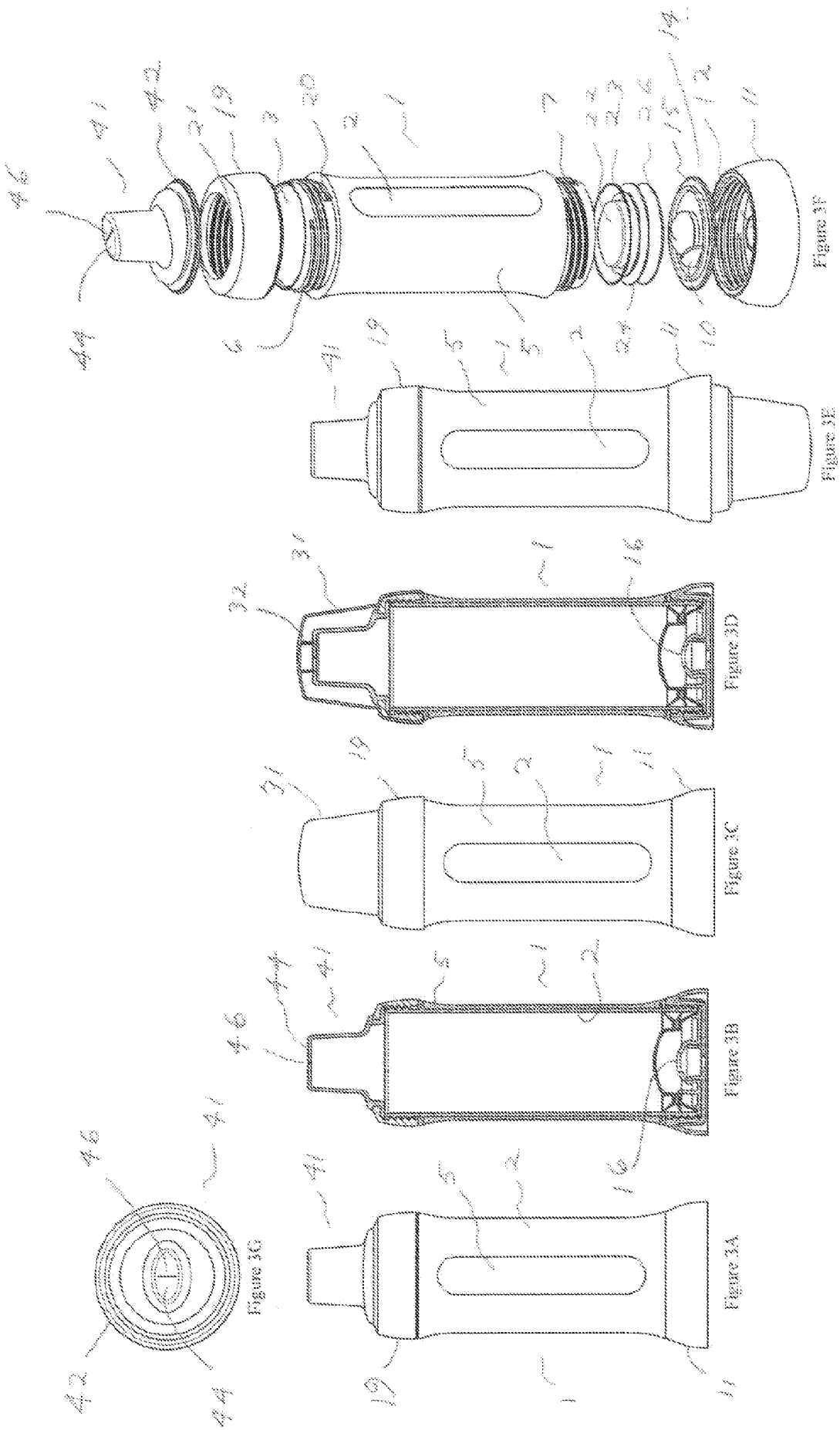
Figure 3F
Figure 3E
Figure 3D
Figure 3C
Figure 3B
Figure 3A
Figure 3G

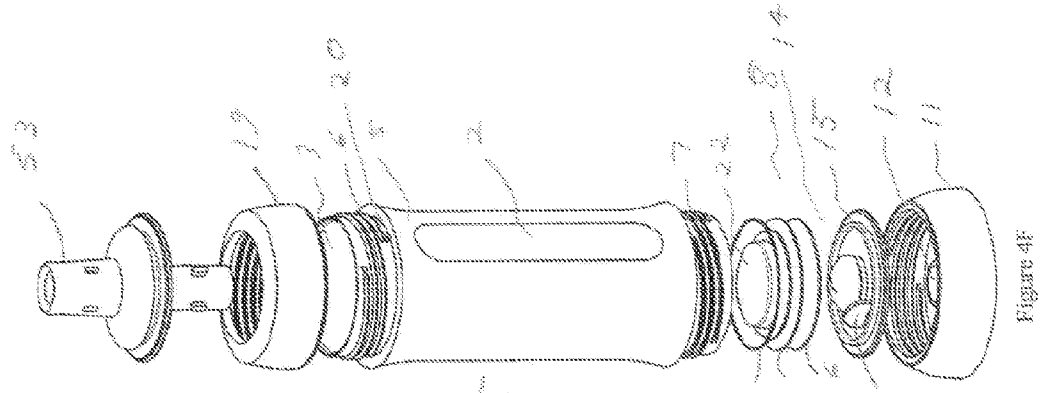

Figure 4F

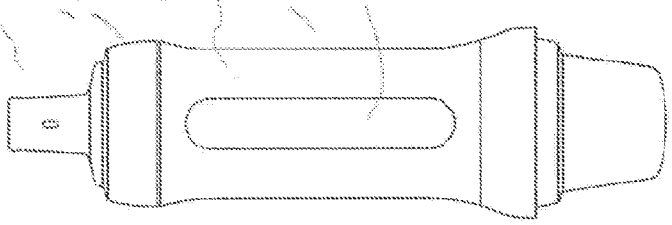

Figure 4E

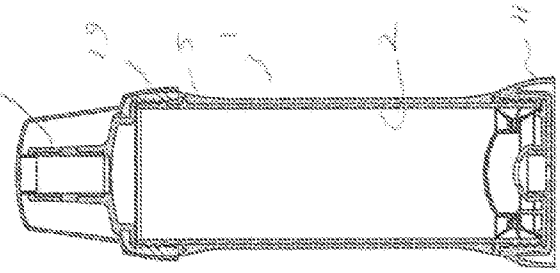

Figure 4D

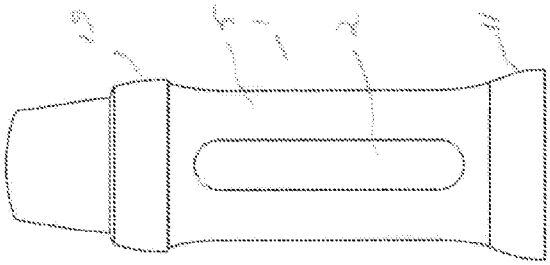

Figure 4C

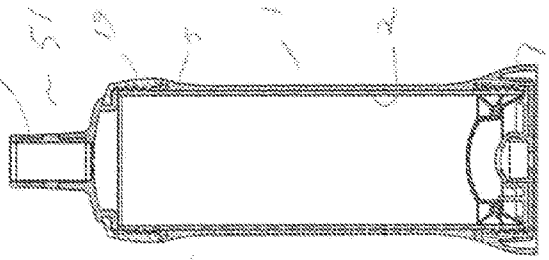

Figure 4B

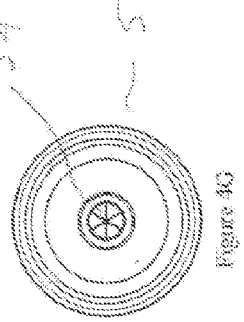

Figure 4G

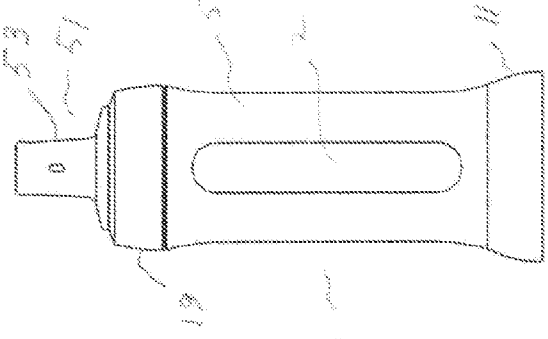

Figure 4A

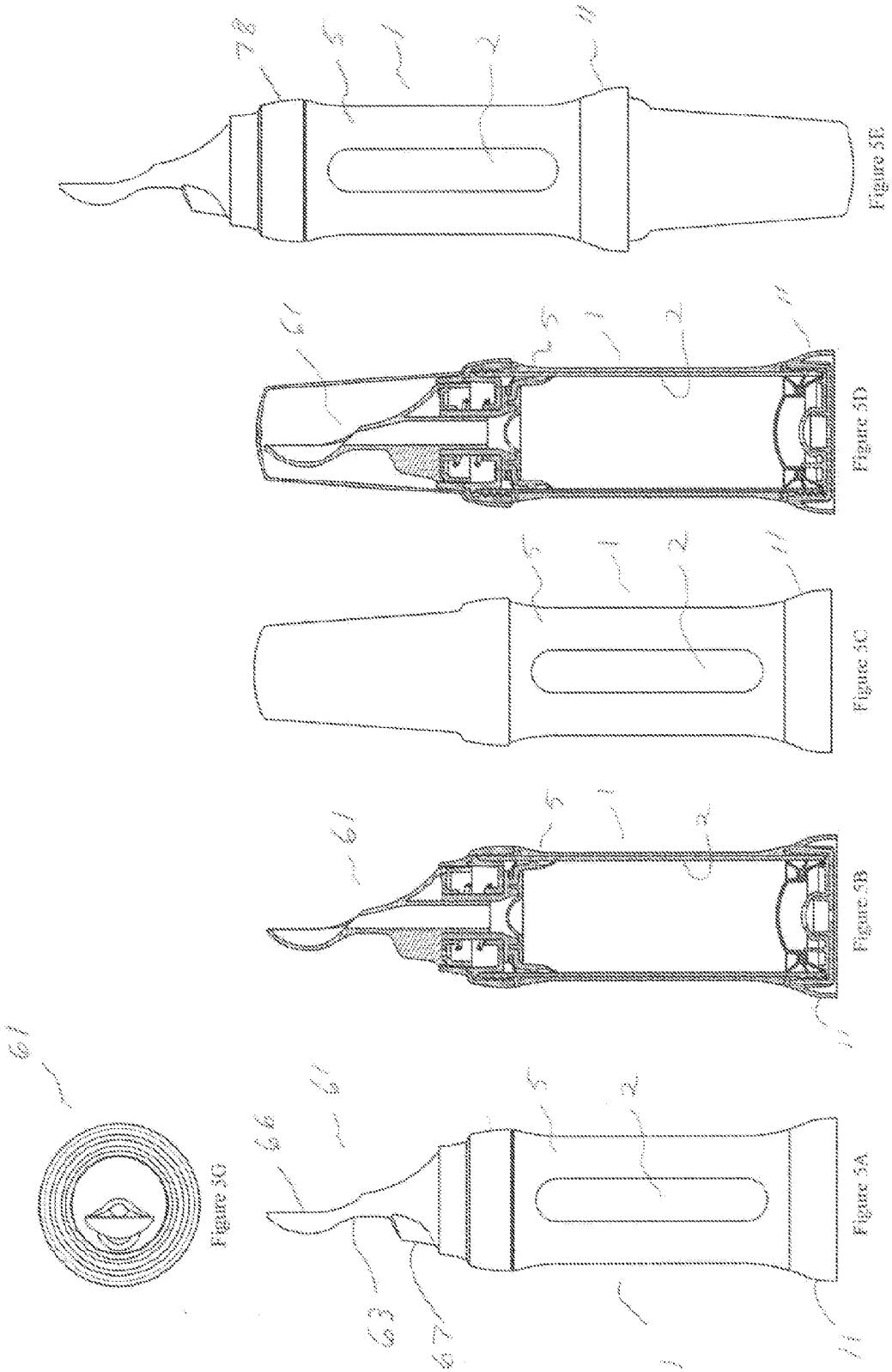
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Figure 5E
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Figure 5D
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Figure 5C
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Figure 5B
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Figure 5A
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Figure 5F

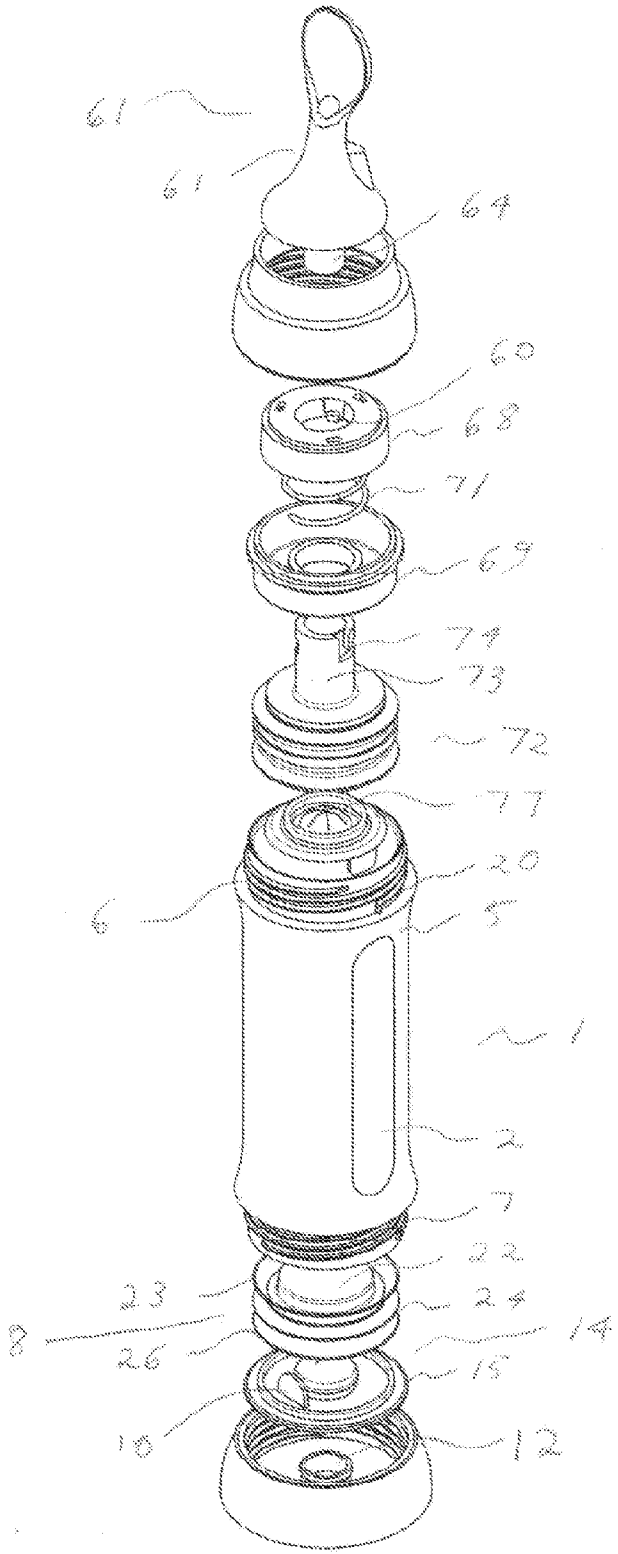

Figure 5F

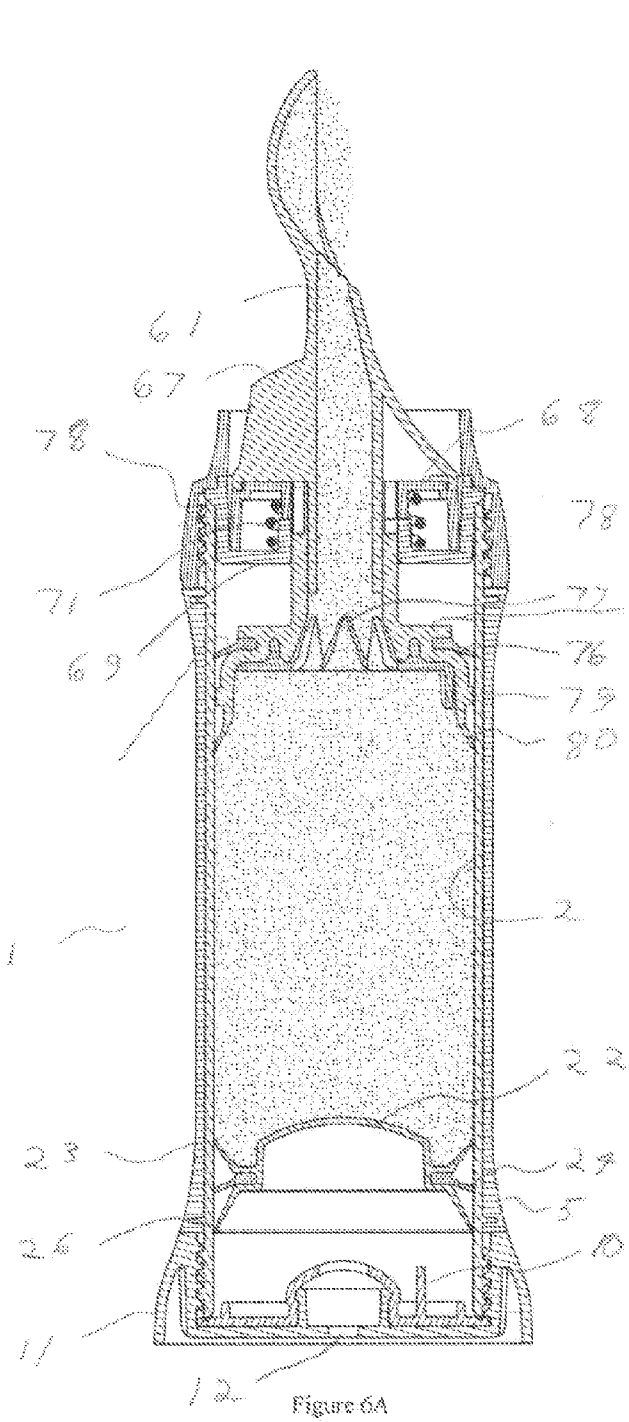

Figure 6A

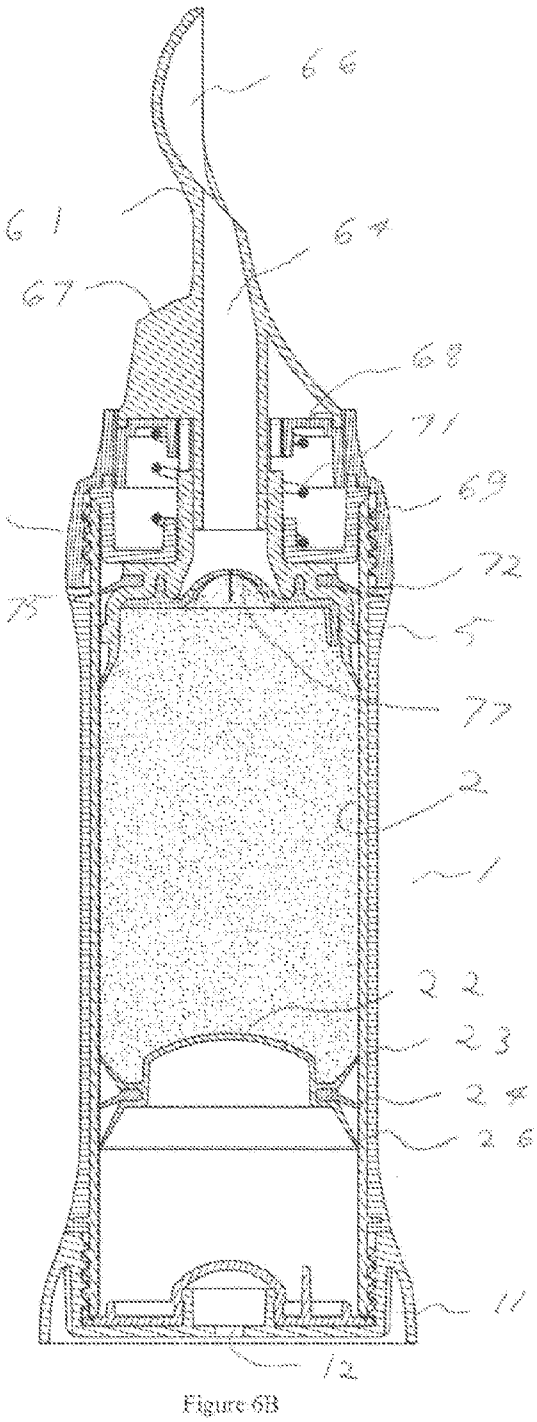

Figure 6B

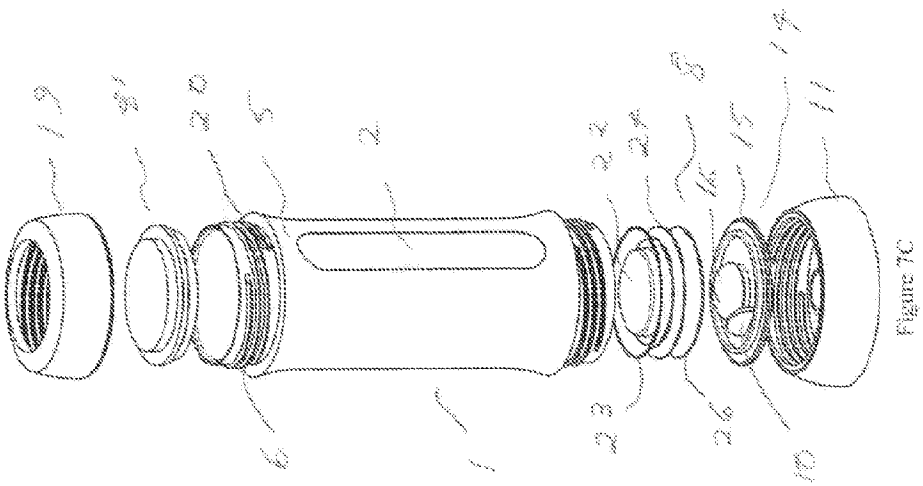

Figure 7C

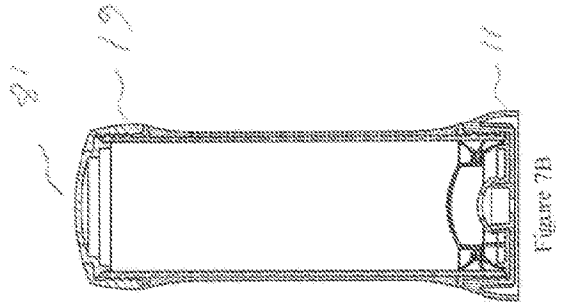

Figure 7B

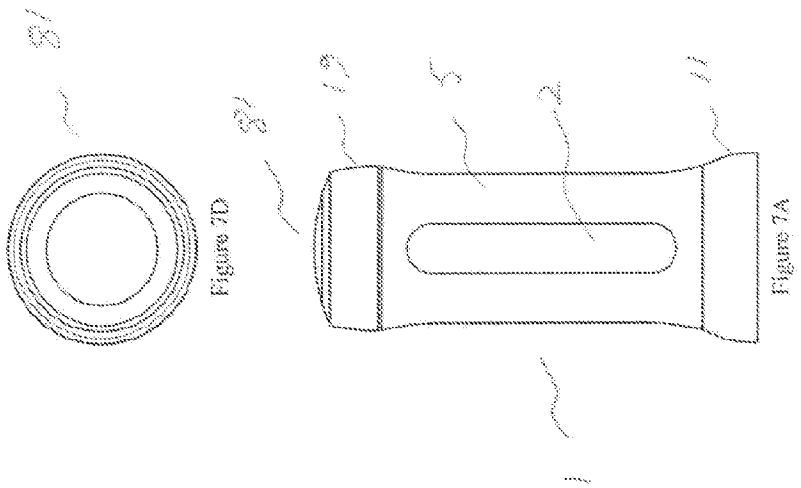

Figure 7D

Figure 7A

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2014/001002

A. CLASSIFICATION OF SUBJECT MATTER

A61J 9/04 (2006.01) A61J 9/08 (2006.01) B05B 11/02 (2006.01) B65D 83/76 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC: CPC MARKS A61J9/04, A61J 9/08, A61J11/04, RANGE OF B0511 marks, RANGE OF B65D marks, G01F11/12, A47K 5/1205, A61J

Full text cluster TXTE, piston, bung, plunger, cap, cover, valve on results from CPC AND IPC A61J, CPC B65D83/14 OR A47K5/1205

Applicant and Inventor in espacenet and Auspat databases

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 January 2015	27 January 2015
Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Matthew Forward AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262832606

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/AU2014/001002**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 1995/004690 A1 (TATULLI) 16 February 1995 Figures 1, 4 to 9, page 1 lines 4 to 7, page 2 lines 17 to 25, page 4 lines 25 to 35, page 5 lins 7 to 14 Figure 1	1-6, 10-13, 16-18, 25-27, 31, 32 7-9, 14, 15
X Y	US 2006/0043117 A1 (LAW et al.) 02 March 2006 Figures 1, 2, 16, paragraphs 0003, 0059 to 0061, 0068 Figures 1 and 2, paragraph 0060, 0067	1-6, 8, 10-13, 16-19, 25-27, 31, 32 7-9, 14, 15, 20-24, 28-30
X Y	EP 2011467 A1 (TOKO YAKUHIN KOGYO KABUSHIKI KAISHA et al.) 07 January 2009 Figures 1 to 4, 8, 9, Paragraphs 0020, 0021 Figures 6, 7, paragraph 0029	1-6,10-13, 16-19, 25-27, 31, 32 7-9, 14, 15, 20-24, 28-30
X Y	US 3093256 A (WOODBURY) 11 June 1963 Column 3 lines 16 to 38, figures Figures	1-3, 6, 10, 16-19, 25 14, 15
X Y	CN 2151747 Y (ZHANG) 05 January 1994 Figure 1 Figure 1	1-3, 6, 10, 16-19, 25 14, 15
Y	US 3108721 A (NEBINGER) 29 October 1963 Figure 1, column 2 line 57 to column 3 line 4, column 3 line 68 to column 4 line 3	7-9
Y	US 2005/0035078 A1 (LIEBERMAN et al) 17 February 2005 Paragraph 0046	14-15
Y	US 2006/0060553 A1 (FLEMING) 23 March 2006 Paragraph 0007, figure 5	15
Y	US 4691847 A (FORD et al.) 08 September 1987 Column 2 lines 32 to 38 and figures 1 to 2	20-24, 28-30
Y	US 5260062 A (GAFFAR) 09 November 1993 column 4 lines 48 to 52, figures 1 and 2	20-24, 28-30
Y	US 2006/0097014 A1 (VON SCHUCKMANN) 11 May 2006 paragraph 0022, figure 4	20-24, 28-30
A	US 1649580 A (GEISLER) 15 November 1927	14-15
A	US 5269426 A (MORANO) 14 December 1993	14-15
A	US 2010/0193459 A1 (HOUSLEY) 05 August 2010	14-15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2014/001002

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including

2. ☐ Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT	International application No. PCT/AU2014/001002

Supplemental Box

Continuation of: **Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1 to 3, 6, 10 to 19 and 25 define a dispenser with a tubular body, a slidable bung, a base cap with an aperture and a top cap. It is considered that the base cap having an aperture that allows airflow into the tubular body and is able to mount the top cap without occluding this airflow is specific to this set of claims.
- Claims 4, 5, 20 to 24 and 26 to 32 define a pump attachment for a dispenser, wherein the pump has the features of a sealing bung, a biasing means and a valve. It is considered that the sealing bung forming a seal with the internal walls of the dispenser is specific to this set of claims.
- Claims 7 to 9 define a dispenser with a tubular body, a slidable bung, a base cap with an aperture and valves mounted in the dispenser. It is considered that the dispenser having a first valve to only allow flow of air into the tubular body and a second valve to only allow flow of material out of the body is specific to this set of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only feature common to all of the claimed inventions and which provides a technical relationship among them is dispensers with a slidable internal bungs and an aperatured base cap

However this feature does not make a contribution over the prior art because it is disclosed in:
the prior art documents D1 to D5 cited in the report and opinion. In addition dispensers with these features are well known in the art and widely disclosed in the patent literature

Therefore in the light of this document this common feature cannot be a special technical feature. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a posteriori*.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2014/001002**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		**Patent Family Member/s**	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
WO 1995/004690 A1	16 February 1995	AU 5690094 A	28 Feb 1995
		BR 9302314 A	07 Feb 1995
		BR 9303061 A	07 Mar 1995
		BR 9303062 A	07 Mar 1995
		BR 9304016 A	06 Jun 1995
US 2006/0043117 A1	02 March 2006	US 7367476 B2	06 May 2008
		AU 2005202903 A1	16 Mar 2006
		AU 2005202903 B2	08 Jan 2009
		AU 2009200740 A1	19 Mar 2009
		AU 2009200740 B2	12 Aug 2010
		AU 2009200742 A1	19 Mar 2009
		AU 2009200742 B2	26 Aug 2010
		BR PI0502445 A	11 Apr 2006
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