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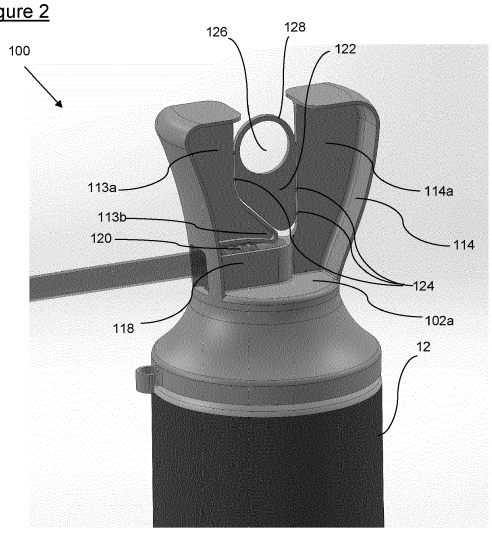
(54) **APPLICATOR FOR A PRESSURE CONTAINER**

(57) An applicator 100, 200 is provided for attachment to a pressure container 10, 10' which includes a composition and a container valve 18, 18'. The applicator includes a cap 102, 202 for fitting to the pressure container over the container valve, the cap including an aperture 130, 230 for receiving a nozzle piece 120, 220, and a body 106, 108; 206, 208 arranged around the aperture on a first side of the cap. The applicator also includes a handle 104, 204 for a person to grip the applicator, the handle comprising first and second handle portions 112, 114; 212, 214 connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap. A tab 122, 222 is provided between the first and second handle portions, in a first configuration the tab being engaged with one or both handle portions and extending through the space between the handle portions to substantially prevent movement of the first handle portion towards the second handle portion, and in a second configuration the tab being disengaged from the first handle portion and/or the second handle portion to allow movement of the first handle portion for operating the container valve during use.

Figure 2



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Description

[0001] The present invention relates to an applicator for attachment to a pressure container, and more particularly but not exclusively for a handheld applicator for attachment to an aerosol can.

BACKGROUND TO THE INVENTION

[0002] Various products or compositions are supplied in pressure containers (or pressurised containers), including aerosols and foams. One application for these products is in the construction industry, including DIY, for example where polyurethane (PU) foam is useful to fill crevices and provide insulation. Some glues and pastes are also available in pressure containers.

[0003] The pressure container is usually cylindrical and made of a metal which can maintain its shape whilst containing the composition at pressure. A valve is provided at the top of the container. Pressing or operating the valve causes an outlet to open, followed by some of the composition exiting the container under pressure. The composition may disperse, expand or react with the air, or a combination of these.

[0004] An applicator (or applicator gun) is often supplied separately to the pressure container and requires the end user to correctly fix the applicator to the pressure container. The pressure container is often inverted for use, with the applicator at the bottom. The applicator can be made of a combination of metal and plastic. Often the applicator is a very basic device which is difficult to use and ergonomically inadequate when attached to a pressure container or can.

[0005] US10106309B2 to Soudal describes an applicator which in some ways improves on a conventional applicator. The applicator is supplied to the end user as part of the pressure container, rather than the end-user needing to attach it themselves. The applicator cannot be removed from the pressure container by hand.

[0006] The applicator in US10106309B2 has a pistol grip, with a ridged grip surface and a moveable trigger having an integral connection for a hose, where the connection projects beyond the moveable trigger. The pistol grip forms the back and sides of the applicator, whilst the trigger is a narrow piece at the front. A safety seal is provided so that the trigger can be secured against movement. A hose can be attached to the connection to help control where the composition is to be applied.

[0007] During use of the device in US10106309B2, with the safety seal flapped open, the trigger portion is squeezed towards the grip surface. This causes the valve on the pressure container to open and dispense composition. However, the safety seal can be a nuisance during use. If the safety seal is not closed properly after use and the projecting end of the connection is accidentally knocked, this can inadvertently open the container valve and dispense some composition from the pressure container.

[0008] It is an object of the present invention to reduce or substantially obviate the aforementioned problems.

STATEMENT OF INVENTION

[0009] According to a first aspect of the present invention, there is provided an applicator for attachment to a pressure container, the pressure container comprising a composition and a container valve, the applicator comprising

a cap portion for fitting to the pressure container over the container valve, the cap including an aperture for receiving a nozzle piece, and a body arranged around the aperture on a first side of the cap, and
a handle for a person to grip the applicator, the handle comprising first and second handle portions connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap,
characterised in that a tab is provided between, or releasably secured between, the first and second handle portions, in a first configuration the tab being engaged with one or both handle portions and extending through the space between the handle portions to substantially prevent movement of the first handle portion towards the second handle portion, and in a second configuration the tab being disengaged from the first handle portion and/or the second handle portion to allow movement of the first handle portion for operating the container valve during use.

[0010] The invention provides a gun-trigger type device which can be attached to an aerosol can or another suitable type of handheld pressurised container. The applicator can be used one-handed for dispensing the contents of the container in a particular direction. The contents may include PU foam or any other composition suitable for dispensing from a handheld pressurised container. The applicator may be considered as an all-in-one dispenser, particularly once assembled to a pressure container. The tab prevents the container valve being inadvertently opened prior to sale and use by an end user, but is easily detached or removed for use.

[0011] The applicator can be supplied pre-attached to a pressure container, providing a safe, ergonomic and ready-to-use device for the end user, whether they are a DIY user or a professional tradesman. The applicator (including the tab, whether or not still attached) can be easily detached for recycling or attachment to a new pressure container having a suitable connection, typically once the existing pressure container has been emptied of its useable contents. The applicator can also be sup-

plied as a discrete item, independently of a pressure container, which is easily attachable to a pressure container and subsequently easily transferrable to another pressure container.

[0012] The cap preferably includes a threaded connector for connection to the pressure container. The threaded connector may be disposed to the first side of the cap for releasably connecting the applicator to a corresponding thread on the pressure container.

[0013] In some embodiments, the cap may include a snap-fit connector for snap-fit connection to the pressure container. The cap may include a lever or release element for releasing the snap-fit connection to remove or ease removal of the cap from the pressure container. However, neither the lever nor the release element is essential for disconnecting the snap-fit connection.

[0014] The screw or snap-fit connections allow the applicator to be easily unscrewed or detached from the pressure container, preferably when the pressure container is empty or has little useable composition remaining. The applicator may then be recycled, or attached to a new pressure container.

[0015] Where a snap-fit connector with a lever or release element is provided, the lever or release element may be part of the cap. The lever may include a plurality of frangible connections to the rest of the cap. The lever may include a distal end which extends beyond the maximum extent of the rest of the cap. That is, relative to a plane meeting a base of the cap, the lever may extend through the plane.

[0016] This provides a handle or lip that can be used to lift the lever whilst the rest of the cap is snap-fitted to a rim on the pressure container, thereby weakening the connection and allowing the applicator to be disconnected from the container. Having the lever extend below the rest of the cap, and so below the container rim, such that it is easily used is preferred, but it is also envisaged that other means could be employed such as a ring-pull type element on the lever.

[0017] The term lever is not necessarily to be construed in a functional sense, because the lever itself does not need to lever the applicator off the container. In some embodiments, the lever may be an elongate element which is hinged at one end where it connects to the applicator, thus resembling the shape of a lever. Lifting the lever upwards may weaken or break the snap-fit connection of the applicator to the container, allowing for applicator detachment without actually levering the applicator off the container. It is nonetheless envisaged that other embodiments may include a lever which may be arranged to in use impart a levering force, e.g. against the container, for detaching the applicator.

[0018] A force transfer element may extend from the first handle portion towards the second handle portion for operating the container valve. The force transfer element may be considered to be a trigger or part of the trigger. The force transfer element may be a projection extending from the second wall of the moveable handle portion. The force transfer element may taper towards a central longitudinal axis of the aperture. The force transfer element or projection may be elongate or may be substantially stub-like.

[0019] A distal portion of the force transfer element may be positioned partway between the first and second handle portions. The distal end of the force transfer element may be in a position overlying the nozzle piece, which may be a nozzle end of the nozzle end. The distal end of the force transfer element may be in a position substantially overlying the aperture and nozzle piece on the second side of the cap for operating the container valve when the first handle portion is moved or pivoted sufficiently towards the second handle portion during use. The force transfer element may extend in a direction towards the nozzle piece.

[0020] The tab may be substantially planar. The tab may be a tear-off tab in some embodiments. The tab can be recycled once removed from the applicator. The tab may have a plurality of frangible connections to either or both of the first and second handle portions. The tab may extend between second walls of each handle portion, where those second walls may each partially span the chamber. The tab prevents movement of the first handle portion towards the second handle portion until the tab has been suitably disconnected.

[0021] In preferred embodiments, the tab may be releasably securable between the handle portions, such that it can be removed for use of the applicator and then replaced between the handle portions. That is, the tab may be selectively moved from the first configuration to the second configuration, and also from the second configuration to the first configuration. This blocks the trigger action where the applicator is on a pressure container which still has an appreciable amount of composition remaining, and which is not going to be used again for a period of time. The releasably securable tab may include engaging means at one or both sides for re-engaging one or both of the handle portions.

[0022] A top of the tab may be substantially flush with a top of the applicator, or may be inset from the top of the applicator. That is, the tab preferably does not protrude above the top of the applicator gun. This applies whether the tab is a tear-off tab or a releasably securable tab.

[0023] The tab may be disconnected from the handle portion(s) by rotation about an axis which is substantially perpendicular to a central longitudinal axis of the aperture and which is substantially parallel to a plane of the tab.

[0024] The tab may be slidable from the first configuration to the second configuration. This allows the tab to be releasably secured in the configuration which blocks trigger action. When slid into the second configuration, the first handle portion may be movable towards the second handle portion. The slidable tab may include one or more detents for engaging corresponding portions of the handle portion(s). The second configuration may involve the tab being completely detached from the handle por-

tions.

[0025] The slidable tab may include a grip region. The grip region may be at an upper end of the tab. The grip region may include one or more ridges or knurling. The grip region may include areas on both sides of the tab. The grip region may be recessed into the tab on one or both sides. There may be a plurality of ridges. The ridge(s) may be curved about an axis which is perpendicular to the plane of the tab.

[0026] The slidable tab may include a channel at one side, or a pair of channels on opposing sides of the tab. Complementary rails or protrusions may be provided on one or both of the corresponding region(s) of the handle portion(s) for receiving the channelled part(s) of the tab.

[0027] The tab may therefore be slid out of the top of the applicator for using the applicator. The tab can be inserted back into position between the handle portions by the reverse movement to block the trigger action. It will be appreciated that equivalent complementary engagement means may be provided by providing rails/protrusions on the side(s) of the tab and corresponding channelled portion(s) on either or both of the handle portions.

[0028] A concave depression or area may be provided on the top of the tab. This is an ergonomic shape for pressing the tab into position between the handle portions.

[0029] The tab may have a substantially trapezoidal cross-section or perimeter. Corners of the tab may be rounded.

[0030] The tab may be substantially symmetrical about a central vertical plane bisecting the tab.

[0031] The tab may include a finger aperture (or finger-sized aperture) for either detaching the tab from or sliding the tab out of engagement with one or both of the handle portions. That is, the tab may include a ring-pull type element. The finger aperture makes it quick and easy to disengage the tab.

[0032] Where the tab includes a finger aperture, the finger aperture may be disposed within the chamber. Alternatively, the finger aperture may be disposed outside the chamber.

[0033] The tab may include a stopper or plug for fitting inside an open end of a straw, particularly when the other end of the straw is connected to the nozzle piece. This is particularly useful where the tab is a frangible or break-off tab. The stopper or plug may be substantially cylindrical with a slightly tapered or conical end. The tab may also include a pair of flanges or guides spaced to either side of the stopper. This provides a pair of recesses into the tab body which helps ensure the cylindrical part of the stopper is engaged in the straw, for preventing flow through the straw.

[0034] A nozzle piece may be disposed through the aperture of the cap. The nozzle piece may include a conduit having an inlet disposed on the first side of the cap for connection to the container valve for receiving composition from the pressure container, and an outlet disposed on the second side of the cap facing towards the first handle portion for dispensing composition. The inlet and outlet may be oriented substantially perpendicular to each other.

[0035] The nozzle piece directs the flow of composition from the chamber laterally from the applicator. An elongate tube or straw can be connected to the nozzle outlet to better direct the flow. The nozzle piece is preferably a separate element so that it can be releasably connected to the applicator. This makes it easier to recycle the applicator if the nozzle piece is made of a different material or if it is contaminated and needs to be disposed of.

[0036] The nozzle piece may be pivotably mounted to the applicator. The nozzle piece may be releasably connected to the applicator. The nozzle piece may include a pair of opposing rods for fitting to corresponding clips on either side of the aperture. The nozzle piece may be pivotably to the underside of the cap.

[0037] A flange with a C-shaped or U-shaped cross-section may be disposed on the second side of the cap around the aperture for fitting around the nozzle piece.

[0038] The flange provides a type of shroud around the nozzle piece to prevent it from being accidentally knocked. This in turn prevents inadvertent opening of the container valve, which would waste some of the composition. Alternatively or additionally, the nozzle piece outlet may be set back from the outer wall of the moveable handle portion for the same reason.

[0039] The first handle portion may include an aperture aligned with a gap in the flange. This may allow for a secondary conduit (such as a tube or straw) to pass through the first handle portion and connect to the nozzle piece outlet. The outlet may be set back from the front of the applicator within the aperture of the first handle portion, or behind that aperture.

[0040] The distal portion of the force transfer element may be disposed on or adjacent to the nozzle piece for applying a force to the nozzle in the direction of the pressure container when the first handle portion is moved or squeezed towards the second handle portion.

[0041] The force transfer element or trigger can move when the first handle portion is moved. In some embodiments, the trigger may pivot into engagement with the nozzle piece, to axially depress the nozzle for opening the container valve. In other embodiments, the trigger may be arranged such that movement of the handle portion may cause translation of the trigger with the same result.

[0042] A first side panel may be releasably fitted between the first and second handle portions on one side of the tab. A first chamber may be provided between or adjacent to the first side panel and the tab. A second side panel may be releasably fitted between or adjacent to the first and second handle portions on the other side of the tab. A second chamber may be provided between the second side panel and the tab. Each chamber may be of a suitable size for receiving a pair of gloves or one or more other accessories. The pair of gloves may be in a packet or sachet, for example. The gloves or other ac-

cessory may be stuck or secured by an adhesive to an inside of the panel, for example.

[0043] Providing removable side panels prevents accidental disengagement of the tab prior to use. The side panel(s) may also be re-fitted to the applicator after use as a stop for preventing movement of the first handle portion, and so preventing accidental dispensing of composition from the pressure container after tab removal or disengagement. The side panels do not get in the way during use of the applicator because they can be fully disengaged from the applicator.

[0044] Either or both side panels may include a concave area which overlies the concave area of the tab.

[0045] Either or both side panels may have a window or central aperture. Either or both side panels may have a skeletal structure. For example, either or both side panels may have a plurality of apertures or slots. This reduces the amount of material required for the side panel(s).

[0046] The side panels may be made of plastic. The side panels may be injection moulded or vacuum formed. The plastic thickness of each side panel may be in the region of 100 to 500 microns, and preferably around 350 microns thick. This provides ultra-thin, flexible side panels which, whilst structurally weak, minimises plastic usage and product weight. Vacuum forming is preferred to minimise side panel thickness.

[0047] Alternatively the side panels may be made of a material selected from: paper, moulded paper pulp, cardboard, micro-fluted board (such as recycled micro-fluted board), or cartonboard, or another similar cellulose-based material. In that case, the side panels may be provided as part of a single or unitary body. The body may have a mid-section located between and joining together the first and second side panels. The body may be folded to substantially fit the first and second panels across opposite sides of the applicator, with the mid-section lying on top of the handle portions, thereby enclosing the chambers on either side. A small amount of adhesive on the mid-section and/or foot sections at distal ends of the side panels (distal relative to the mid-section) may be used to temporarily secure the U-shaped cover on the applicator.

[0048] The side panels may be embossed and/or printed with indicia. The indicia or embossed detailing may include one or more: a logo, written and/or pictorial instructions or information, and safety or regulatory material.

[0049] The applicator may be made of plastic. The applicator may be formed by injection moulding. The applicator may be integrally formed (although the nozzle piece may be provided as a discrete element). The first handle portion may be connected to the cap via a living hinge or otherwise flexibly joined thereto.

[0050] Either or both of the first and second handheld portions may include a first outer wall for a person to grip during use, and a second wall extending towards the other of the handle portions across the chamber. The second wall may be orthogonal to the outer wall, providing a substantially T-shaped cross-section. This strengthens each handle portion whilst using less plastic material than known prior art devices. The tab may be connected between the second walls of the handheld portions, or between the second wall of one portion and an inner face of the outer wall of the other portion.

[0051] The first and second handheld portions may be of similar size. The length of each handheld portion measured relative to a central longitudinal axis of the aperture may be substantially the same. The lateral width of each handheld portion to either side of the aperture may be substantially the same. The height of each handheld portion away from the second side of the cap may be substantially the same. The first and second handheld portions may provide substantially similar grip areas in terms of surface area. The first handheld portion may have a concave outer surface. The second handheld portion may have a convex outer surface.

[0052] This provides a handheld trigger which is balanced with the static handle portion, contributing to improved control during use.

[0053] The outer wall of the first handheld portion may include a substantially smooth outer surface. The outer wall of the second handheld portion may include a substantially smooth outer surface. The curvature of each outer wall may vary smoothly. That is each outer wall may not have sudden discontinuities or angular projections.

[0054] According to a second aspect of the present invention, there is provided an applicator (or applicator assembly) for attachment to a pressure container, the pressure container comprising a composition and a container valve, the applicator comprising

a cap for fitting to the pressure container over the container valve, the cap including an aperture for receiving a nozzle piece, and a body arranged around the aperture on a first side of the cap, and

a handle for a person to grip the applicator, the handle comprising first and second handle portions connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap,

characterised in that a nozzle piece is provided, the nozzle piece being connected to the cap such that the nozzle piece passes through the aperture of the cap, the nozzle piece including a conduit having an inlet disposed on the first side of the cap for connection to the container valve for receiving composition from the pressure container, and an outlet disposed on the second side of the cap facing towards the first handle portion for dispensing composition; and

the cap includes releasable connection means for

releasably connecting the applicator to the pressure container, the releasable connection means comprising one of: a threaded connector disposed around the aperture on the first side of the cap for releasably threadingly engaging the applicator with a corresponding thread on the pressure container; a snap-fit connector disposed around the aperture on the first side of the cap for snap-fit connection to the pressure container, optionally including a lever or release element in the cap for releasing the snap-fit connection to ease removal of the cap from the pressure container.

[0055] Advantages of this aspect of the invention are similar to those of the first aspect of the invention. In particular, the detachable nozzle piece and releasable connection means enable the applicator to be easily detached from a pressure container and recycled. The separate nozzle piece is particularly advantageous in this respect because it may be manufactured from a different material better suited to throughput of the composition during use, and thus may need to be recycled separately. Also, where the nozzle is contaminated or gummed up' with composition and is not easily cleaned, it can be disposed whilst the remainder of the applicator assembly may be recycled.

[0056] According to a third aspect of the present invention, there is provided an applicator for attachment to a pressure container, the pressure container comprising a composition and a container valve, the applicator comprising

a cap for fitting to the pressure container over the container valve, the cap including an aperture for receiving a nozzle piece, and a body arranged around the aperture on a first side of the cap, and
a handle for a person to grip the applicator, the handle comprising first and second handle portions connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap,
characterised in that the cap includes releasable connection means for releasably connecting the applicator to the pressure container, the releasable connection means comprising one of: a threaded connector disposed around the aperture on the first side of the cap for releasably threadingly engaging the applicator with a corresponding thread on the pressure container; a snap-fit connector disposed around the aperture on the first side of the cap for snap-fit connection to the pressure container, and a lever or release element in the cap for releasing the snap-fit connection to ease removal of the cap from the pressure container.

[0057] The screw or snap-fit connections allow the applicator to be easily unscrewed or detached from the pressure container, preferably when the pressure container is empty or has little useable composition remaining. The applicator may then be recycled, or attached to a new pressure container. Other advantages described for the first aspect of the invention are also applicable.

[0058] According to a fourth aspect of the invention, there is provided a pressure container comprising a composition within the pressure container, a container valve for dispensing the composition from the pressure container, and an applicator according to the first or second aspects of the invention, the applicator being releasably connected to the pressure container and arranged to operate the container valve.

[0059] Any feature or features presented with respect to the one aspect of the invention may be provided in any other aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0060] For a better understanding of the present invention, and to show more clearly how it may be carried into effect, reference will now be made by way of example only to the accompanying drawings, in which:

Figure 1 shows a perspective view of a first embodiment of an applicator, attached to a pressure container;

Figure 2 shows a close-up perspective view of the applicator of Figure 1, with a side panel removed;

Figure 3 shows a perspective view of a side panel of the applicator of Figure 1;

Figure 4 shows a perspective view of the applicator and pressure container of Figure 1, where the applicator has been detached from the pressure container;

Figure 5 shows a perspective view of the top of a second embodiment of a pressure container;

Figure 6 shows a perspective view of the top of the pressure container of Figure 5, with a nozzle piece and attached conduit in situ;

Figure 7 shows a cross-sectional side view of the applicator of Figure 1;

Figure 8 shows a perspective view of a second embodiment of an applicator;

Figure 9 shows a second perspective view of the applicator of Figure 8;

Figure 10 shows an underside perspective view of the applicator of Figure 8, with a nozzle piece connected to the applicator;

Figure 11 shows an underside perspective view of the applicator of Figure 10, with the nozzle piece detached from the applicator;

Figure 12 shows a perspective view of the applicator of Figure 8 attached to a pressure container;

Figure 13 shows a perspective view of the applicator and pressure container of Figure 12, where a tab is being detached from the applicator;

Figure 14 shows a perspective view of the applicator and pressure container of Figure 13, following tab removal;

Figure 15 shows an exploded perspective view of the applicator and pressure container of Figure 14, where the applicator has been detached from the pressure container;

Figure 16 shows a partial perspective view of a third embodiment of an applicator for a pressure container, including a slidable tab;

Figure 17 shows a second partial perspective view of the applicator of Figure 16, with the slidable tab removed;

Figure 18A shows a first perspective view of the slidable tab of the applicator of Figure 16;

Figure 18B shows a first perspective view of the slidable tab of the applicator of Figure 16;

Figure 19 shows a side view of a fourth embodiment of an applicator, with a slidable tab;

Figure 20 shows a side view of a fifth embodiment of an applicator, with a frangible tab;

Figure 21 shows a perspective view of another embodiment of an applicator, with skeletal side panel;

Figure 22 shows a perspective view of a side panel with a window; and

Figure 23 shows a perspective view of an applicator with a card cover.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0061] Referring firstly to Figures 1 to 7, a first embodiment of an applicator is indicated generally at 100. The applicator 100 is a handheld applicator. The applicator 100 is made of plastic and is formed by injection moulding.

[0062] In Figure 1, the applicator 100 is connected to a handheld pressure container 10. The pressure container contains polyurethane foam in this embodiment, but it will be appreciated that other contents may be provided in other embodiments. The pressure container 10 is shown in more detail in Figures 4-6. The pressure container 10 includes a cylindrical body 12 having a circumferential rim or lip 14 at one end for the applicator 100 to fit over. An external thread 16 is disposed on a central longitudinal axis for the applicator to screw onto. A container valve 18 is provided in a centre of the screw-threaded section 16. The valve 18 is selectively operable to open an outlet (not shown) to dispense the pressurised contents of the container 10. The valve in this embodiment is a gun valve, but it will be appreciated that the valve may be another type of valve if it can be depressed to open the container outlet.

[0063] Note that the pressure container 10 in Figures 5-6 has a slightly different valve 18, but for the purposes of this disclosure the valves are equivalent and are not described separately.

[0064] The applicator 100 includes a cap portion indicated generally at 102 and a handle portion indicated generally at 104. The cap portion 102 has a circumferential outer wall 106 approximately in the shape of a frustum cone, with a slightly concave curvature to the surface. This defines a chamber 103 (see Figure 4) for receiving the top of the container. A circumferential flange 108 is provided at a lower end of the outer wall 106. A C-shaped one-piece clip 110 is provided at the front of the circumferential flange 108 for clipping a tube or straw 20 against the container 10.

[0065] The handle portion 104 is joined to the cap portion 102 at an upper end of the cap portion 102, furthest from the circumferential flange 108. The handle portion 104 includes a moveable portion 112 and a static or fixed portion 114. The portions 112, 114 are not directly connected to each other. That is, they are connected via the cap portion 102.

[0066] The moveable portion 112 is used as a trigger for dispensing product from the container 10. The trigger 112 has a smooth, slightly concave surface (see Figure 7). The trigger 112 extends substantially perpendicularly from the cap portion 102, before curving away from a central longitudinal axis of the applicator 100. Towards the top end of the trigger 112, the trigger 112 smoothly curves into a horizontal wall, which is in a plane substantially parallel to the top of the cap portion 102.

[0067] The moveable portion 112 is flexibly joined to the cap portion 102. This could be achieved via a living hinge, for example, but a hinge is not essential. The moveable portion 112 is joined to the cap portion 102 by first and second connections 112a to either side of an aperture 112b through the moveable handle portion 112. The connections 112a are integrally formed with the moveable portion 112. The aperture 112b is provided

through the outer wall of the handle portion 112, and provides a path for the tube 20 to connect to a nozzle piece.

[0068] The fixed portion 114 is connected to the cap portion 102 across from the moveable handle portion 112. The fixed portion has a substantially similar shape to the moveable portion 112 save that it has a slightly convex outer wall (see Figure 7), as opposed to a slightly concave outer wall.

[0069] First and second sidewall pieces 116 are fitted to either side of the handle portions 112, 114. The sidewall pieces 116 are sized to have a friction fit within flanges of the handle portions 112, 114. One of the sidewalls is shown in Figure 3. Each sidewall has planar wall 116a and a peripheral flange 116b around some or all of an edge of the planar wall 116a for providing the friction fit. The shape of the sidewalls 12 provides chambers within the applicator 100 on either side of a central vertical plane bisecting the applicator 100 and handle portions 112, 114. An aperture is provided at the top of the applicator 100, between the tops of the sidewalls 116, leading into the chambers within the applicator 100.

[0070] Figure 2 shows the applicator 100 with the sidewalls removed 116. The cap portion 102 can be seen to include a planar circular top 102a to which the handle portions 112, 114 are connected. A U-shaped flange 118 is provided on top of the cap portion 102 around a nozzle piece 120. The flange has a U-shaped cross-section when viewed along a central longitudinal axis of the applicator 100. The nozzle piece 120 is oriented such that it extends towards the aperture 112b in the moveable handle portion 112, and the open end of the U-flange 118 shaped is aligned with the aperture 112b. The tube 20 is connected to the nozzle outlet.

[0071] The moveable handle portion 112 includes a vertical wall 113a extending towards a centre of the applicator 100. The wall 113a includes a trigger element or force transfer element 113b. The trigger element 113b is an approximately triangular projection which curves down towards, and terminates just above, the nozzle piece 120.

[0072] The fixed handle portion 114 includes another vertical wall 114a extending towards a centre of the applicator 100. The wall 114a is substantially coplanar with the corresponding wall 113a on the other handle portion 112. Each wall 113a, 114a gives its respective handle portion a T-shaped cross-section for strength. However, only the wall 114a for the static handle portion 114 extends down to the cap portion 102. The wall 113a on the moveable portion terminates at the aperture 112b, to provide flexibility for pivoting the handle 112. The wall 114a on the fixed handle portion 114 is joined to the curved end of the U-shaped flange 118 in this embodiment for added rigidity.

[0073] A tab 122 is provided between the walls 113a, 114a of the handle portions 112, 114. The tab 122 has a planar body in this embodiment, and is coplanar with the walls 113a, 114a. A plurality of frangible connections (some of which are indicated at 124) join the tab 122 to each handle portion 112, 114. The tab 122 has a finger-sized aperture 126 at its top end, and a thin strip 128 around the aperture for pulling the tab 122. The tab 122 has an approximately triangular body portion below the aperture 126 for substantially complementing or accommodating the trigger 113b. The tab 122 can be manually pulled out of its plane to detach it from the handle portions 112, 114.

[0074] It will be appreciated that the tab 122 may in some embodiments be configured such that complete detachment is unnecessary. For example, the tab may slide out of position to detach it from either handle portion, or the tab may be hingedly moved out of engagement from one of the handle portions. The key principle is that the tab 122 no longer bridges between the handle portions, and cannot therefore block movement of the moveable handle portion 112 towards the fixed portion 114 when the handle 104 is squeezed to dispense composition from the container 10.

[0075] Referring also to Figure 4, the applicator 100 includes a central aperture 130 for the nozzle piece 120. An internal thread 132 is provided in the underside of the cap portion, around the central aperture 130. The thread 132 complements the external thread 16 of the container 10 to provide a releasable connection between the applicator 100 and container 10.

[0076] The nozzle piece 120 is releasably connected to the underside of the circular cap top 102a by virtue of a pair of rods 120a fitting into corresponding clips 102b on either side of the aperture 130. The rods 120a are shown more clearly in Figure 6, where the nozzle 120 is shown absent the rest of the applicator 100 on top of the container 10.

[0077] An inlet end 120b and outlet end 120c are also best seen in Figure 6. The inlet end 120b of the nozzle piece is cylindrical and open-ended for fitting over or to the container valve 18. The rods 120a extend out of opposite sides of the nozzle piece, set in from the inlet end 120b. The main body of the nozzle piece is right-angled and has a correspondingly-shaped conduit inside which leads to the outlet 120c. The outlet 120c has ribs around it for improving the connection or seal formed with the tube 20. Figure 7 shows how the shape of the inlet end 120b is adapted to fit the container valve 18.

[0078] In use, the applicator 100 is connected to the container 10 by aligning the applicator 100 and container 10 on a common central longitudinal axis and screwing the applicator until a tight connection between the screw threads 16, 132 is achieved. The container 10 should be shaken before use, although the exact point at which this is done does not particularly matter. The tube 20 is fitted onto the nozzle outlet 120c and the sidewalls 116 removed from the applicator 100. If gloves have been provided within either chamber, then the gloves may now be put on. The tab 122 is then torn out of position, breaking the frangible connections 124 and freeing the trigger handle 112 for use.

[0079] The end of the tube 20 is aligned with the in-

tended location for receiving PU foam, with the container 10 inverted such that the handle portion 104 is lower than the cap portion 102. The handle portion 104 can then be squeezed, forcing the trigger element 112 into contact with the top of the nozzle piece, which in turn depresses the container valve and dispenses PU foam through the nozzle piece and tube 20. It will be appreciated that the nozzle piece 120 is adapted to provide enough of a seal to ensure the composition must exit via the end of the tube 20 rather than at an earlier point in the flow path.

[0080] Once the PU foam has been applied where required to the extent required, the user can cease squeezing handle portion 104. This allows the container valve 18 to shut and the nozzle piece 120 and moveable handle 112 return to (or are biased back into) their default positions. The dispensing operation may be repeated as needed.

[0081] To secure the tube 20 after use, it can be pivoted down and clipped into the clip 110. The sidewalls 116 can be pushed back into either side of the applicator 100, between the handle portions 112, 114, to secure the moveable handle 112 against operation.

[0082] Figures 7-15 illustrate a second embodiment of an applicator, indicated generally at 200, and a corresponding pressure container 10'. The applicator 200 and container 10' have some similar features to the equivalent devices in the first embodiment, and like reference numerals will be used to refer to like features where appropriate. The following sections will primarily focus on those elements which differ from the features of the first embodiment. Whilst similar features to the first embodiment are only referred to in passing, or not referred to directly at all, this is for brevity only and details equivalent to the first embodiment are to be assumed unless otherwise indicated.

[0083] The applicator 200 has handle portion 212, 214 which are substantially similar to those of the first embodiment. A tab 222 is provided between corresponding walls 213a, 214a of the handle portions 212, 214, although in this embodiment the tab 222 is longer and extends beyond the upper ends of each handle portion 212, 214 such that the ring section formed by the aperture and strip 226, 228 is visible above the handle portions.

[0084] However, it will be appreciated that this merely illustrates the option to have different sizes of tab, and it is preferred that the tab is flush with the top of the applicator or that it terminates at a position below the top of the applicator.

[0085] The clip 210 on the cap portion 202 is provided in two opposing arcuate segments rather than a single C-shaped clip. A similar tube 20' can fit into the clip.

[0086] The flange 218 around the nozzle piece 220 has a C-shaped cross-section when viewed from above, rather than a U-shaped cross-section. Whilst this provides a slight gap compared to the first embodiment, the nozzle piece 220 is still adequately shielded against accidental knocks.

[0087] Referring to Figures 9 and 10, a lever 234 is shown in the cap portion 202. It will be appreciated that part of the cap portion 202 forms the lever 234. Sides of the lever 234 are connected to the rest of the cap portion via frangible connections 236. A lifting tab 238 is provided at a free end of the lever 234. The lifting tab 238 lies below the rim of the cap portion flange 208. The other end of the lever 234 is hingedly connected to the cap portion 202.

[0088] Figures 10 and 11 show that a snap-fit connector 232 in the form of a circular rim or lip is provided in the underside of the cap portion 202. This is instead of the internal thread of the first embodiment. The lever 234 intersects or cuts through the snap-fit connector 232. This enables the snap-fit connection to be broken when the lever 234 is raised out of the cap portion 202, for detaching and recycling the applicator 200 separately to the container 10'. The container 10' has a corresponding rim 16' for the snap fit connector 232 to connect to.

[0089] It will be appreciated that the lever 234 does not need to be frangibly connected to the cap portion 202. For example, the lever may have one or more protrusions which engage corresponding recesses in the cap portion, or another arrangement which permits the lever to be releasably secured in both container-engaging and container-disengaging positions at will, rather than single use. That is, the lever may be configured to allow the applicator to be secured to a different container after detachment from the first container, rather than immediately recycled.

[0090] Referring to Figures 12-15, use of the applicator 200 is similar to the first embodiment. The applicator is first snap fitted to the container by coaxial movement onto the top of the container 10'. The tab 222 is torn out in the direction indicated by arrow A, after removal of the sidewalls (in embodiments where sidewalls are provided). To dispense composition, the moveable handle portion 212 is squeezed or pivoted towards the other handle portion 214, and this causes the trigger element 213b to depress the nozzle 220 and dispense composition from the pressure container 10'. Removal of the squeezing or pivoting force allows the moveable portion 212 to relax back to its default position in the reverse direction to arrow B.

[0091] To remove the applicator from the container 10', the lever 234 is lifted via the lifting tab 238 whilst applying suitable force in the direction of arrow C to break the frangible connections 236. The lever 234 may flex as shown in Figure 15 but the applicator material is resilient enough not to snap. Suitable opposing force may be used to keep the container in position, for example by pressing it down onto a table. Once done, the applicator can then be lifted away from the container 10' in the direction of arrow D.

[0092] Figures 16 to 18B show a third embodiment of an applicator for a pressure container, where the applicator is indicated generally at 300. The applicator 300 and its container have some similar features to the equivalent devices in the first and/or second embodiments,

and like reference numerals will be used to refer to like features where appropriate. The following sections will primarily focus on those elements which differ from the features of the preceding embodiments. Whilst similar features to the preceding embodiments are only referred to in passing, or not referred to directly at all, this is for brevity only and details equivalent to the first or second embodiments are to be assumed present unless otherwise indicated.

[0093] The applicator 300 includes a slidable tab 322. The tab 322 is disposed between the handle portions 312, 314 in Figure 16, and removed entirely from the applicator 300' in Figure 17. This is accomplished by gripping and sliding the tab upwards, out of the top of the applicator 300.

[0094] It can be seen in Figure 17 that the handle portions 312, 314 each include a linear rail 340a, 340b. The rails can be considered to be part of a tab connection system. The rails 340ab are parallel to each other. The second rail 340b is longer than the first rail 340a, but each rail terminates at its top end substantially at the same distance from the top of the applicator 300.

[0095] Each rail has a T-shaped cross-section in this embodiment, with a central pillar extending from the inner face of the handle portion 312, 314 and opposing guides on either side of the pillar section. It will be appreciated that other shapes of rail or protrusion may be suitable in other embodiments.

[0096] The slidable tab 322 is shown in more detail in Figures 18A and 18B. The tab 322 includes a pair of parallel lateral sides which include first and second side channels 322a, 322b for receiving the respective rails 340a, 340b. The tab 322 is substantially symmetrical about a central plane running through its body and intersecting the channels 322ab.

[0097] Recessed grip areas are provided on each side of the tab 322. The grip areas each include a set of three curved ridges respectively indicated at 322c and 322d. The grip areas are sized for receiving a thumb and finger to pull the tab out of the applicator so that it is ready for use. A concave thumb- or finger-shaped area 322e is provided on top of the tab 322 for pressing it back into place between the handle portions 312, 314 when the applicator is no longer being used.

[0098] Figure 19 shows a variant of the applicator with sliding tab in Figure 16. Similar features to those of previous embodiments are generally present except as now described. In Figure 19, the applicator 400 has a first handle 412 with a stub-like trigger 413b arranged over the nozzle piece. Instead of pressing centrally on top of the nozzle piece 420 during use, the trigger 413b engages the ribbed end (not visible) of the nozzle, in the region suitable for the straw to be connected. This rocks or tilts the nozzle piece and activates the valve in a similar manner to that described earlier in this specification. The sliding tab 422 in this embodiment has a semi-circular end for insertion either way round.

[0099] Figure 20 shows a variant of the applicator with frangible tab in Figure 7. Similar features to those of previous embodiments are generally present except as now described. In Figure 19, the applicator 500 has a first handle 512 with a stub-like trigger 513b, which operates in a similar manner to that of Figure 19. The frangible tab 522 has a substantially conical stopper 550, which has a rounded end. The stopper 550 is mounted on a hollow cylindrical portion 552 of the tab.

[0100] A pair of wings or guide portions 554 are arranged on opposing side of the hollow cylinder 552. Each guide portion 554 includes a planar body which is connected to the respective adjacent handle 512, 514 by frangible connections. Each guide portion 554 extends in parallel with the cylinder and conical portions 552, 550, terminating in a distal end inset from the rounded end of the conical portion 550. The guide portions 554 are spaced from the cylindrical and conical portions 552, 550 to provide a slot for receiving a straw, when the tab is used to block the open end of the straw after use of the applicator to dispense composition from a pressure container such as an aerosol can.

[0101] Figure 21 illustrates a variant of the side panel design shown in Figure 3. The side panel 616 includes a concave thumb- or finger-shaped area 656 on the top for accommodating a similar area on the tab. The sides of each panel includes a series of parallel slots 658. This reduces the amount of plastic in the side panels and minimises overall weight, whilst still allowing an accessory such as a sachet of gloves to be retained. This type of side panel is suitable for use with any applicator of the invention.

[0102] Figure 22 illustrates another variant of the side panel design shown in Figure 3. The side panel 716 includes a concave area 756 like that in Figure 21. The side panel 716 also includes a single central window or aperture 759. The perimeter of the window 759 is substantially congruent with the perimeter of the side panel 716. Providing a large window further reduces plastic usage relative to the variant in Figure 21, but the size of the accessory object (packet of gloves, paper manual, etc.) may be small enough to exit through the window 759 in some cases. Therefore, it is sometimes preferred to use a small amount of adhesive to weakly bond the accessory or accessories to a surface in the applicator, or to secure the accessory or accessories using a resilient clip or crevice in the applicator, for example. It should be noted that adhesive, resilient clip(s) and/or crevice(s) may be used in any embodiment of the invention. This type of side panel is suitable for use with any applicator of the invention, but is preferred where the tab is frangible.

[0103] Figure 23 illustrates a cover 860 for an applicator 800, such as those described in the preceding embodiments. The cover 860 is suitable for use in place of the plastic side panels of any applicator according to the invention, covering both sides of the applicator with a single cover. Rather than being made of plastic, the cover 860 is made of card. Only one side is shown, but the structure of the cover 860 is the same on the other side

of the applicator.

[0104] The cover 860 has a central strip of card 862 joined to side covers 864 by hinge sections 865. A small amount of adhesive may be used to secure the central strip 862 to the top of the applicator. The side covers 864 fit across the space between the handle portions 812, 814 on either side of the applicator 800. The cover 860 is folded into a substantially U-shaped form to fit over the applicator 800. The side covers 864 are folded at the bottom to provide feet 866 which can be secured by adhesive to the applicator 800 for holding each side of the cover in place. In this embodiment, the feet are shaped as segments of a circle for fitting neatly within the circular top of the cap portion of the applicator in this embodiment, but the shape of the feet can be different in other embodiments. It will be appreciated that other suitable means may be used to secure the cover, e.g. engaging the feet through slots or with projections/recesses in or on the applicator. The card may be pierced by projections to temporarily hold it on the applicator for example.

[0105] The embodiments described above are provided by way of example only, and various changes and modifications will be apparent to persons skilled in the art without departing from the scope of the present invention as defined by the appended claims.

Claims

1. An applicator (100, 200) for attachment to a pressure container (10, 10'), the pressure container comprising a composition and a container valve (18, 18'), the applicator comprising
   a cap (102, 202) for fitting to the pressure container over the container valve, the cap including an aperture (130, 230) for receiving a nozzle piece (120, 220), and a body (106, 108; 206, 208) arranged around the aperture on a first side of the cap, and
   a handle (104, 204) for a person to grip the applicator, the handle comprising first and second handle portions (112, 114; 212, 214) connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, providing a chamber between the handle portions, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap,
   characterised in that
   a tab (122, 222) is provided between, or releasably secured between, the first and second handle portions, in a first configuration the tab being engaged with one or both handle portions and extending through the chamber between the handle portions to substantially prevent movement of the first handle portion towards the second handle portion, and in a second configuration the tab being disengaged from the first handle portion and/or the second handle portion to allow movement of the first handle portion for operating the container valve during use.

2. An applicator (100) as claimed in claim 1, in which the cap includes a threaded connector (132) to the first side of the cap for releasably connecting the applicator to a corresponding thread (16) on the pressure container.

3. An applicator (200) as claimed in claim 1, in which the cap includes a snap-fit connector (232) for snap-fit connection to the pressure container.

4. An applicator (100, 200) as claimed in any of claims 1 to 3, in which a force transfer element (113b, 213b) extends from the first handle portion towards the second handle portion for operating the container valve, a distal portion of the force transfer element (113b, 213b) being positioned partway between the first and second handle portions in a position substantially overlying the nozzle piece (120, 220) on the second side of the cap for operating the container valve when the first handle portion (112, 212) is moved or pivoted sufficiently towards the second handle portion (114, 214) during use.

5. An applicator (100, 200) as claimed in any of claims 1 to 4, in which the tab (122, 222) has one or more frangible connections (124, 224) to either or both of the first and second handle portions.

6. An applicator (100, 200) as claimed in any of claims 1 to 5, in which the tab is slidable from the first configuration to the second configuration to allow movement of the first handle portion towards the second handle portion.

7. An applicator (100, 200) as claimed in any of claims 1 to 6, in which the tab includes a finger aperture (126, 226) for either detaching the tab from or sliding the tab out of engagement with one or both of the handle portions.

8. An applicator (100, 200) as claimed in any of claims 1 to 7, in which a nozzle piece (120, 220) is disposed through the aperture of the cap, the nozzle piece including a conduit having an inlet (120b, 220b) disposed on the first side of the cap for connection to the container valve for receiving composition from the pressure container, and an outlet (120c, 220c) disposed on the second side of the cap facing towards the first handle portion for dispensing composition.

9. An applicator (100, 200) as claimed in claim 8, in which the nozzle piece (120, 220) is pivotably mounted to the applicator.

10. An applicator (100, 200) as claimed in claim 8 or 9, in which a flange (118, 218) with a C-shaped or U-shaped cross-section is disposed on the second side of the cap around the aperture for fitting around the nozzle piece.

11. An applicator (100, 200) as claimed in claim 10, in which the first handle portion includes an aperture (112b, 212b) aligned with a gap in the flange for receiving a secondary conduit (20, 20') through the first handle portion for connection to the nozzle piece outlet.

12. An applicator (100, 200) as claimed in any of claims 8 to 11, when dependent on claim 4, in which the distal portion of the force transfer element (113b, 213b) is adjacent to the nozzle piece for applying a force to the nozzle piece in the direction of the pressure container.

13. An applicator (100, 200) as claimed in any of claims 1 to 12, in which first and second side panels (116) are releasably fitted between or adjacent to the first and second handle portions on either side of the tab (122, 222), and first and second chambers between the tab and the respective side panels for receiving a pair of gloves or one or more other accessories.

14. An applicator (100, 200) for attachment to a pressure container (10, 10'), the pressure container comprising a composition and a container valve (18, 18'), the applicator comprising

a cap (102, 202) for fitting to the pressure container over the container valve, the cap including an aperture (130, 230) for receiving a nozzle piece, and a body (106, 108; 206, 208) arranged around the aperture on a first side of the cap, and

a handle (104, 204) for a person to grip the applicator, the handle comprising first and second handle portions (112, 114; 212, 214) connected to the cap and extending away from the aperture to a second side of the cap, the handle portions being spaced apart on opposite sides of the aperture on the second side of the cap, the first handle portion being moveably connected to the cap for operating the container valve, and the second handle portion having a substantially fixed position relative to the cap,

characterised in that

a nozzle piece (120, 220) is provided, the nozzle piece being connected to the cap such that the nozzle piece passes through the aperture of the cap, the nozzle piece including a conduit having an inlet (120b, 220b) disposed on the first side of the cap for connection to the container valve for receiving composition from the pressure container, and an outlet (120c, 220c) disposed on the second side of the cap facing towards the first handle portion for dispensing composition; and

the cap includes releasable connection means for releasably connecting the applicator to the pressure container, the releasable connection means comprising one of:

a threaded connector (132) disposed around the aperture on the first side of the cap for releasably threadingly engaging the applicator with a corresponding thread (16) on the pressure container (10);

a snap-fit connector (232) disposed around the aperture on the first side of the cap for snap-fit connection to the pressure container (10').

15. A pressure container (10, 10') comprising a composition within the pressure container, a container valve (18, 18') for dispensing the composition from the pressure container, and an applicator (100, 200) as claimed in any of claims 1 to 14, the applicator being releasably connected to the pressure container and arranged to operate the container valve.

Figure 1

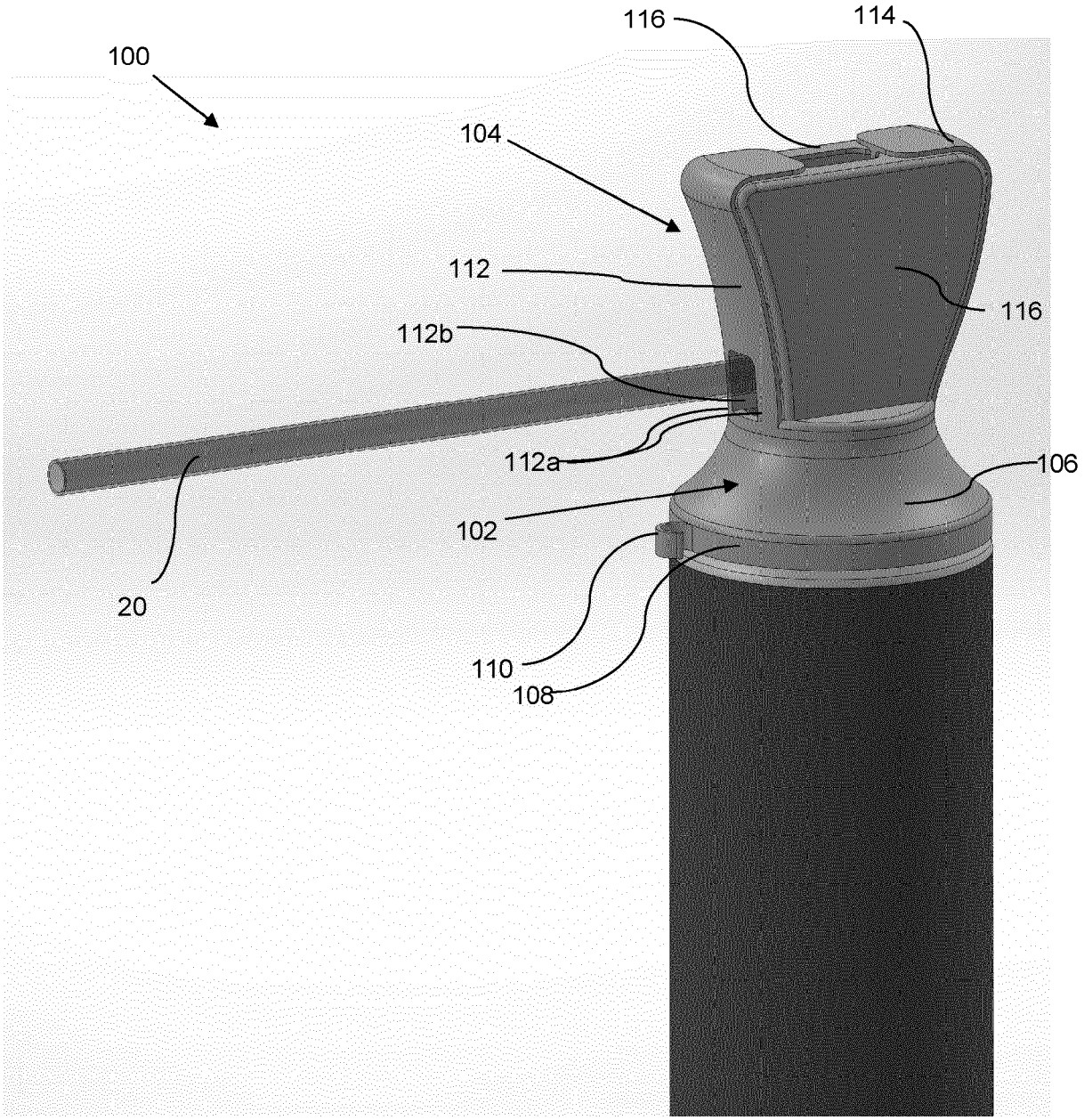


Figure 2

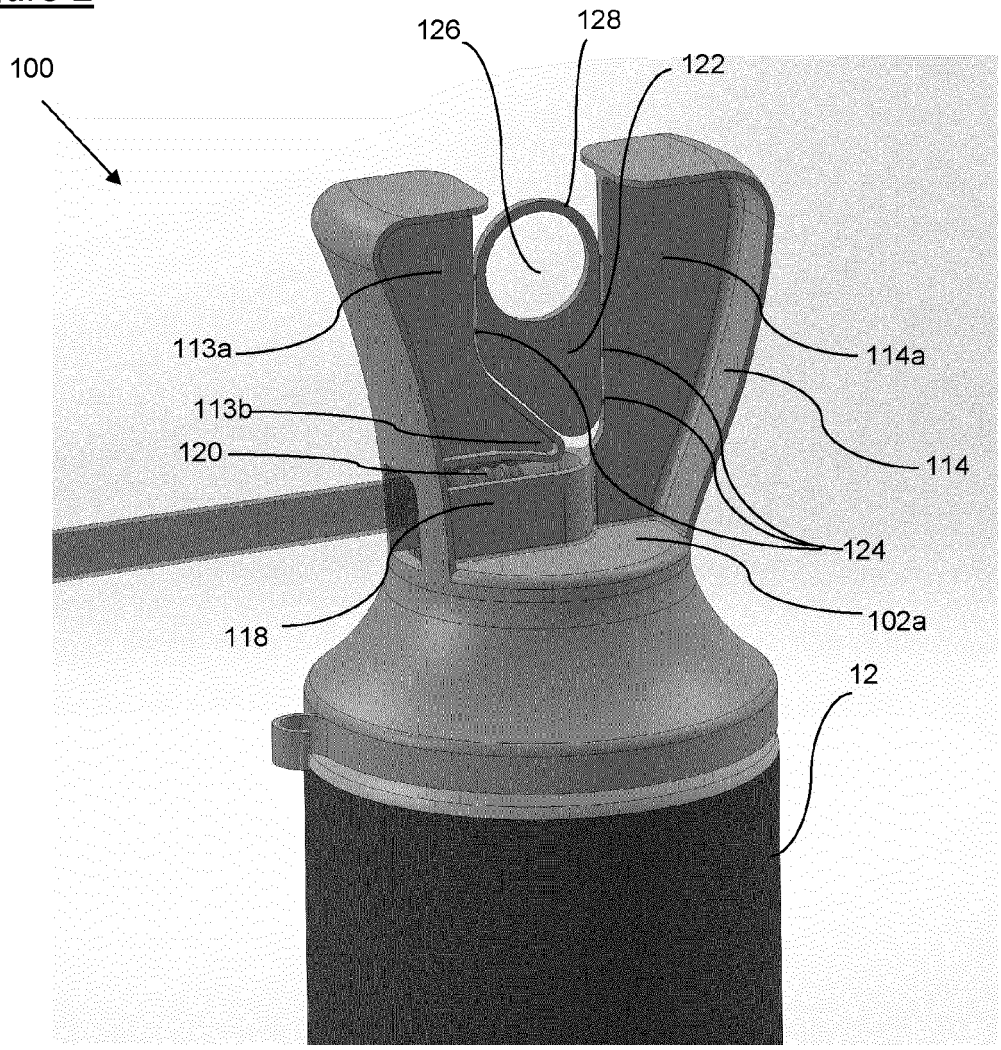


Figure 3

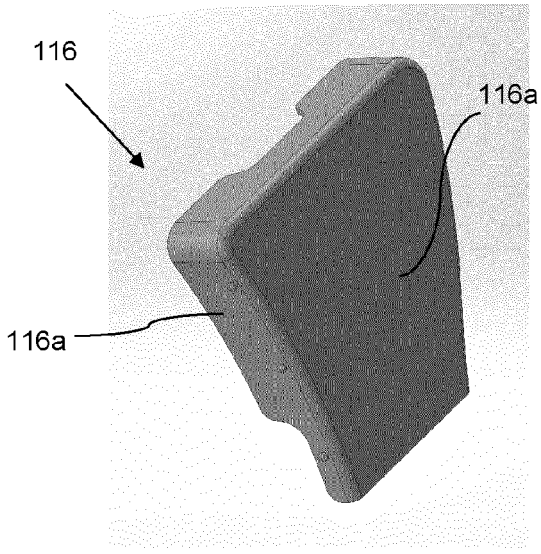


Figure 4

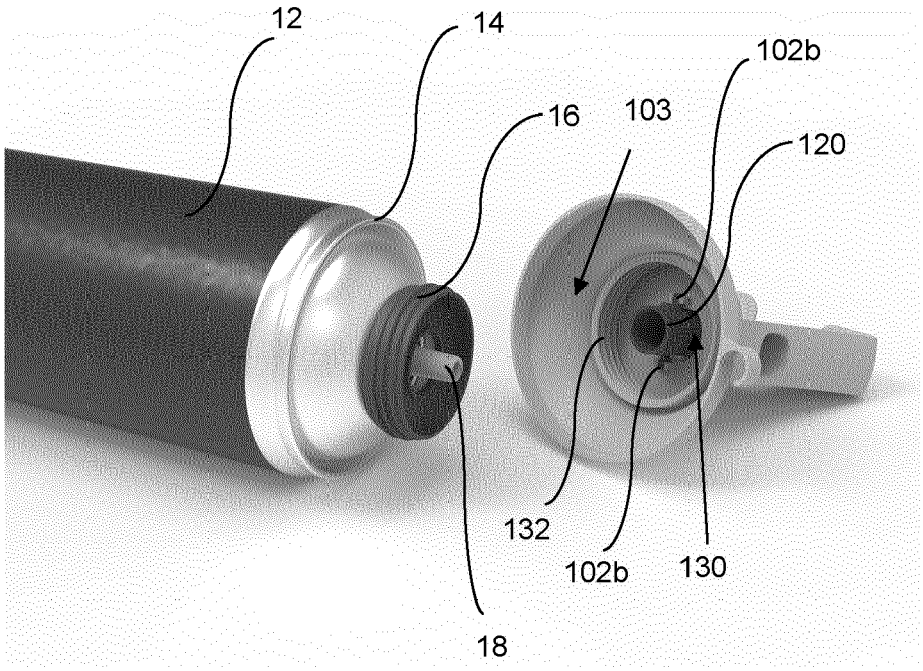


Figure 5

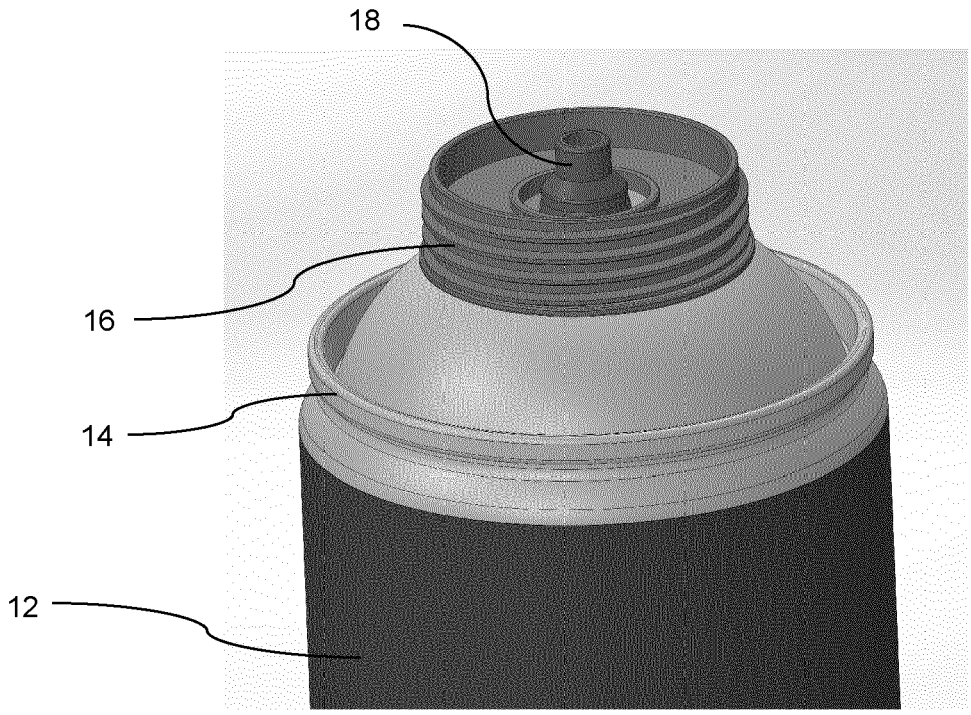


Figure 6

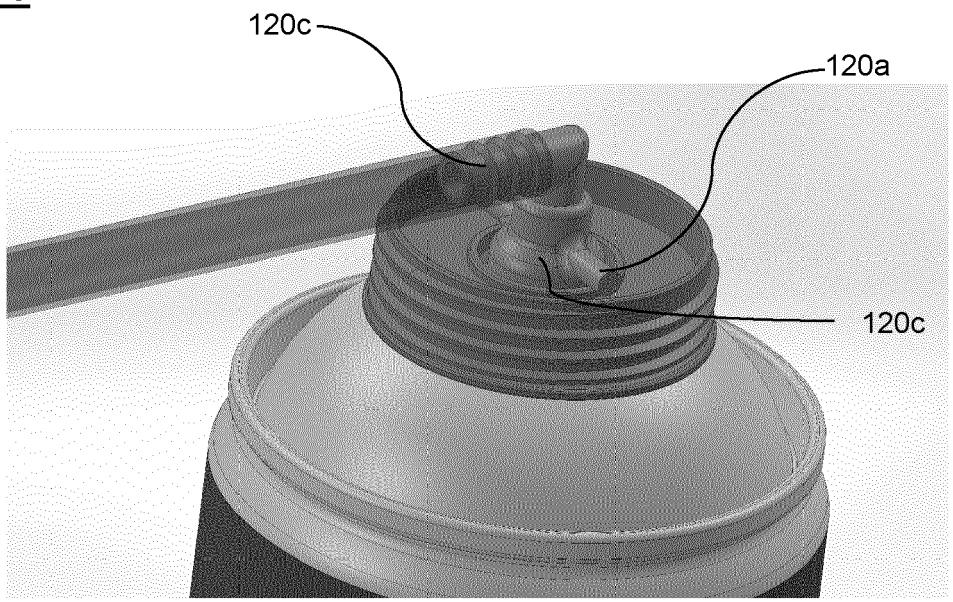


Figure 7

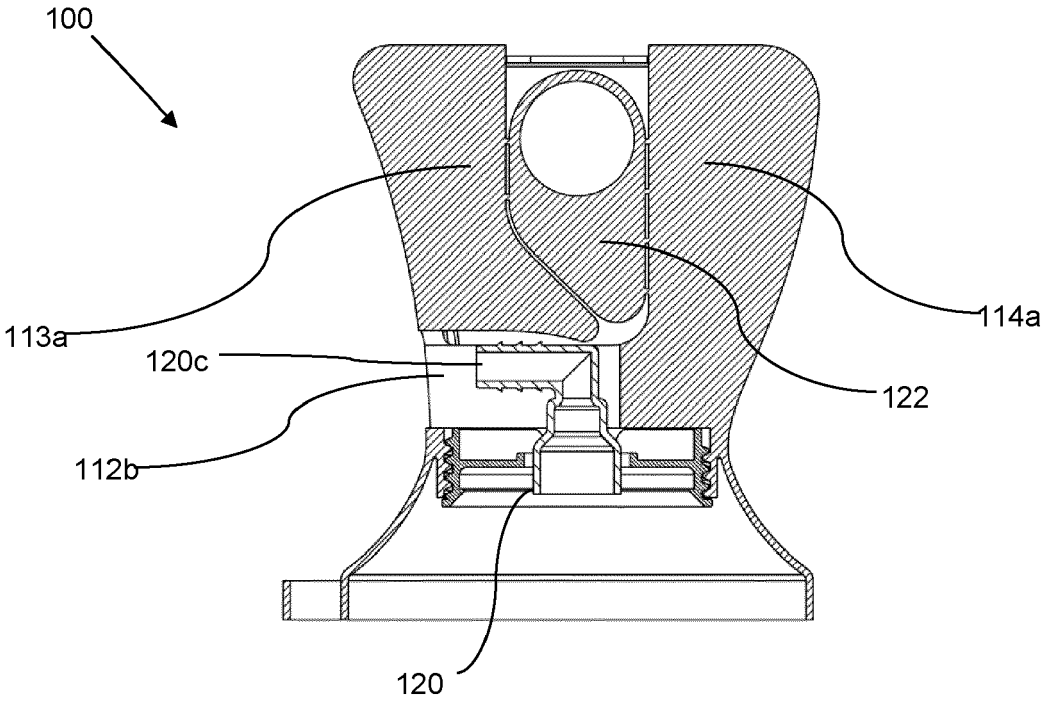


Figure 8

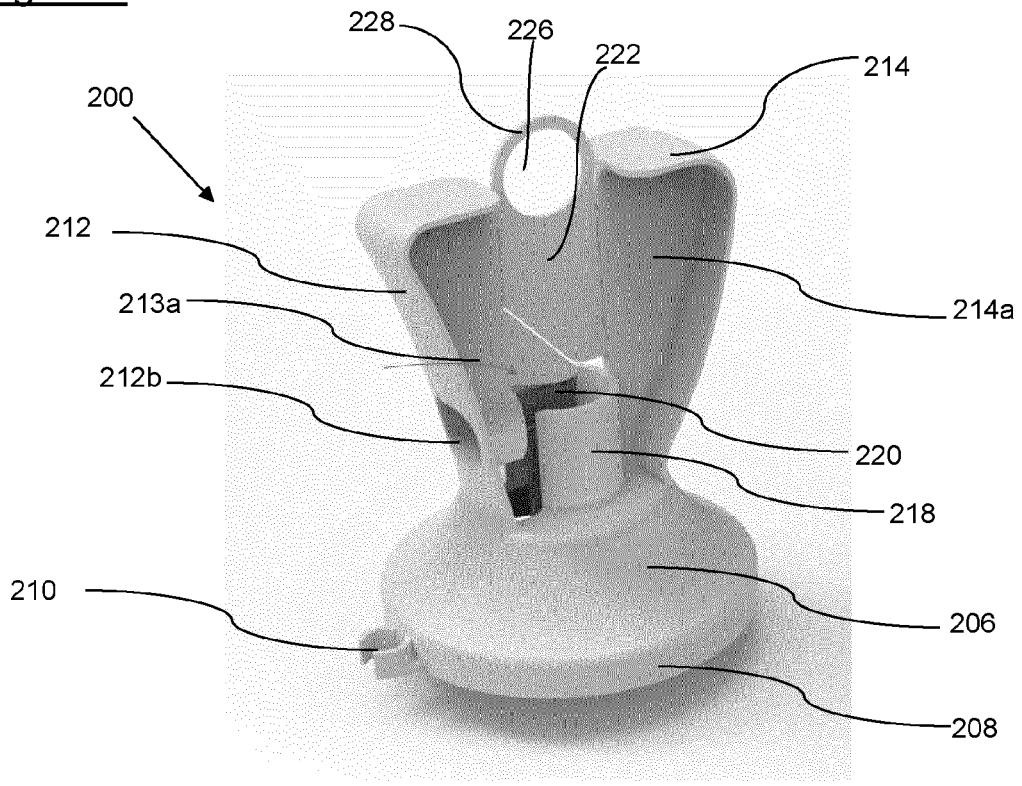


Figure 9

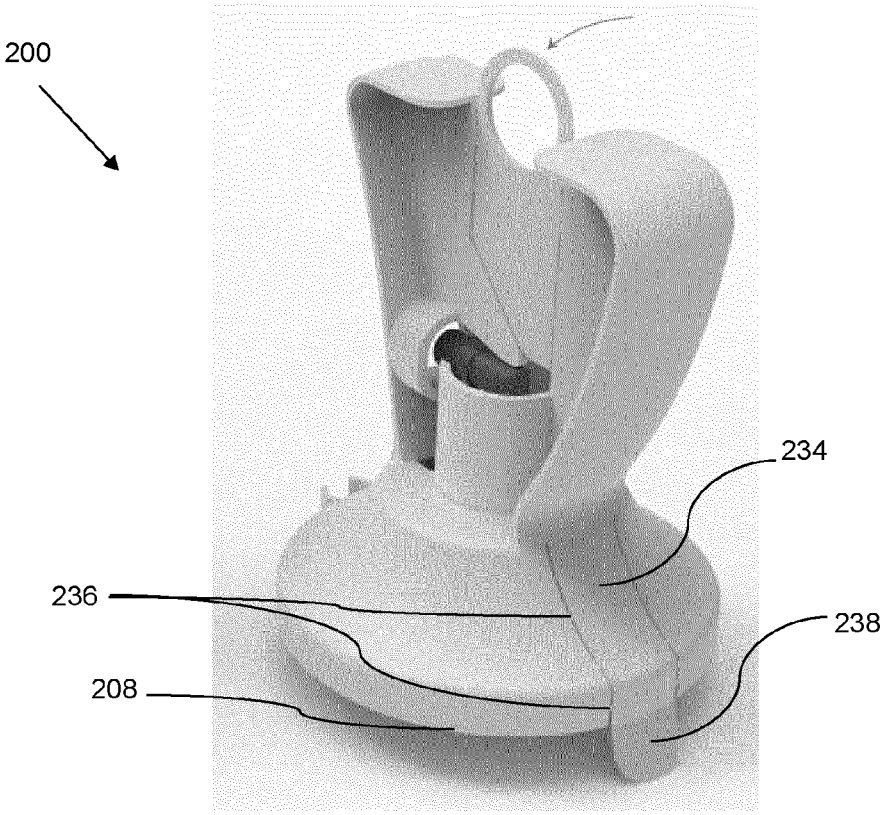


Figure 10

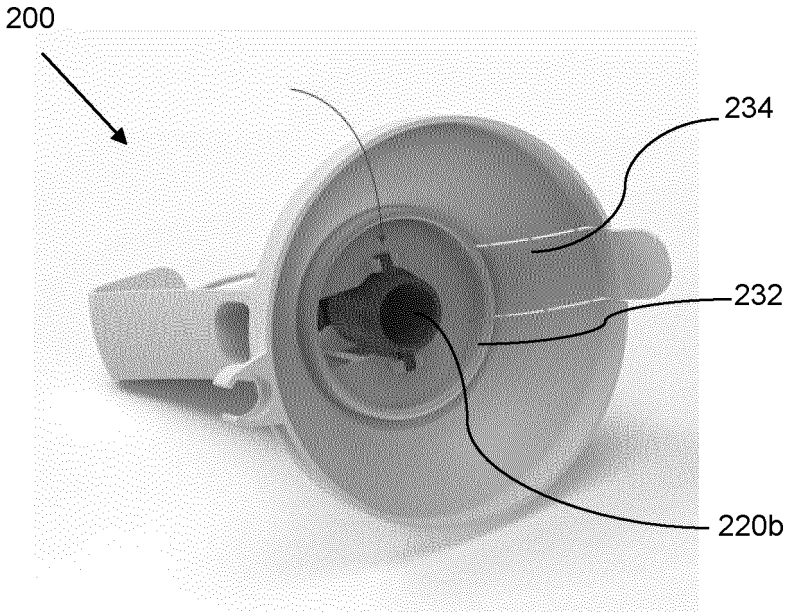


Figure 11

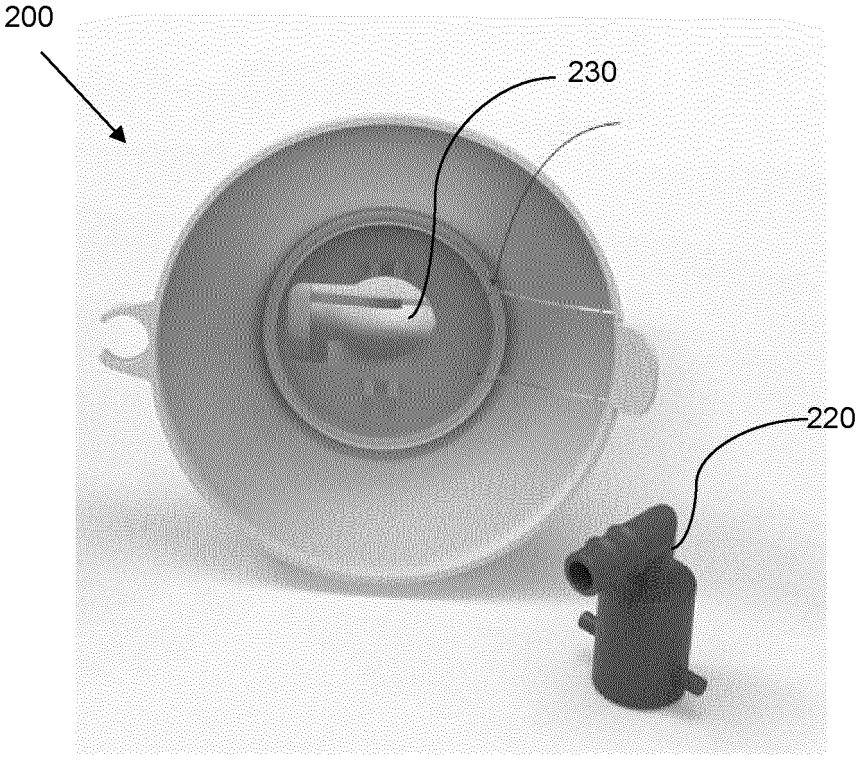


Figure 12

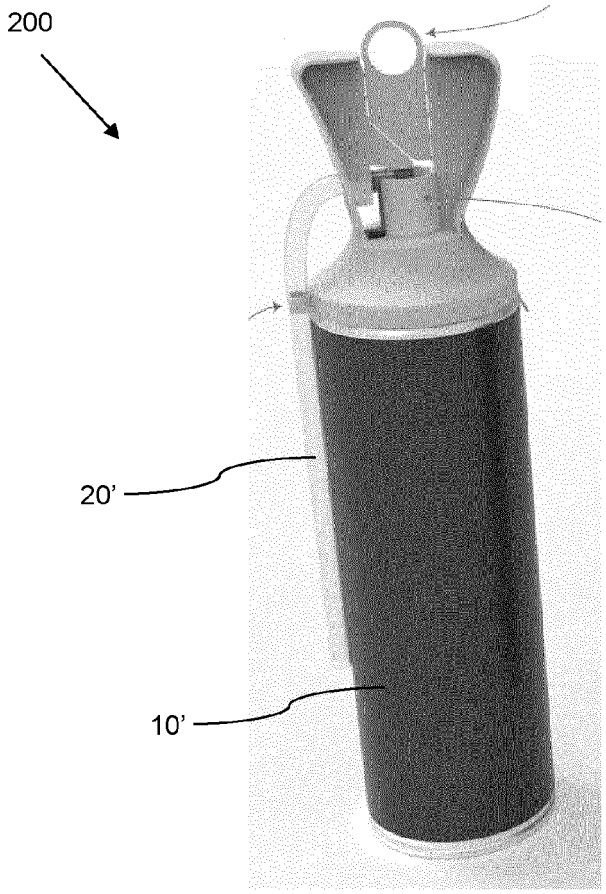


Figure 13

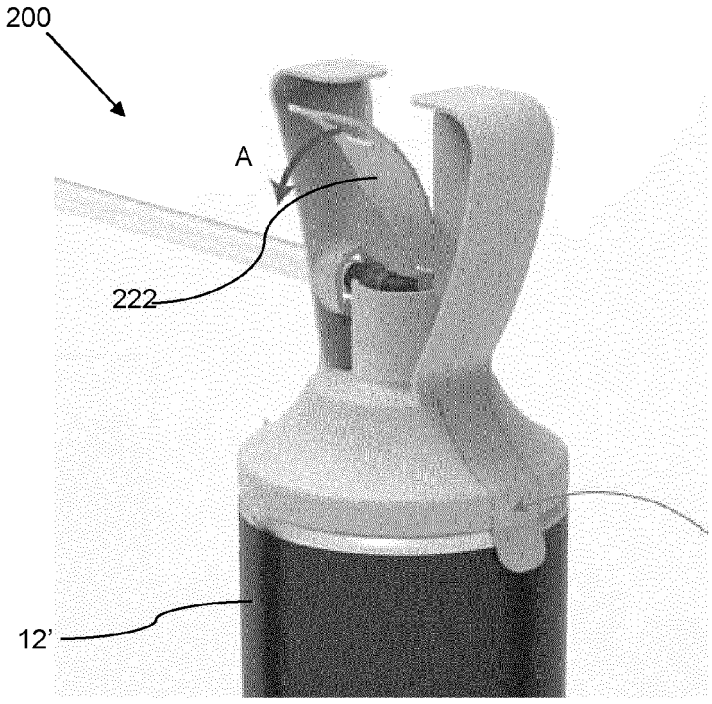


Figure 14

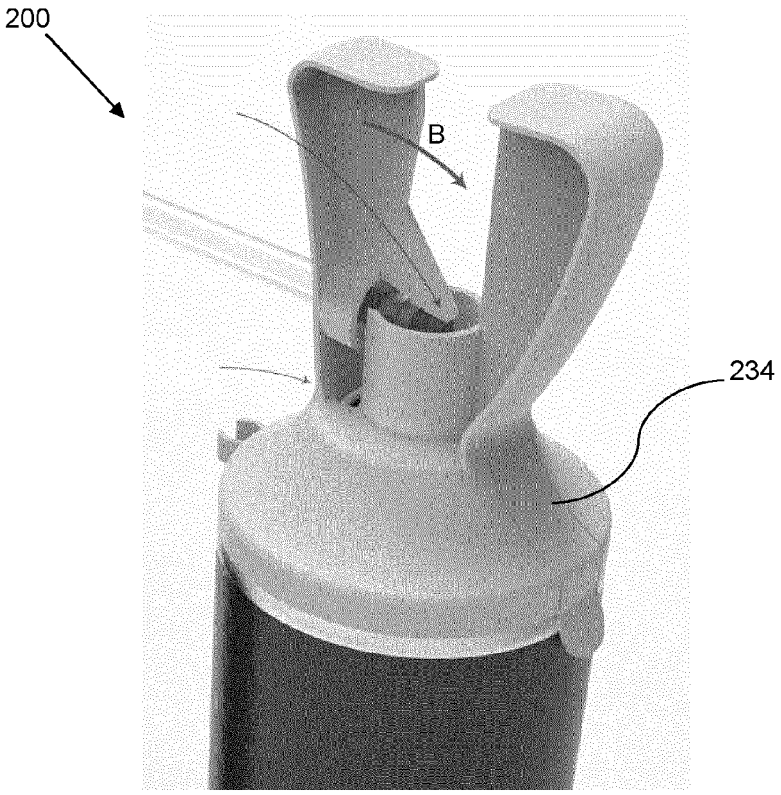


Figure 15

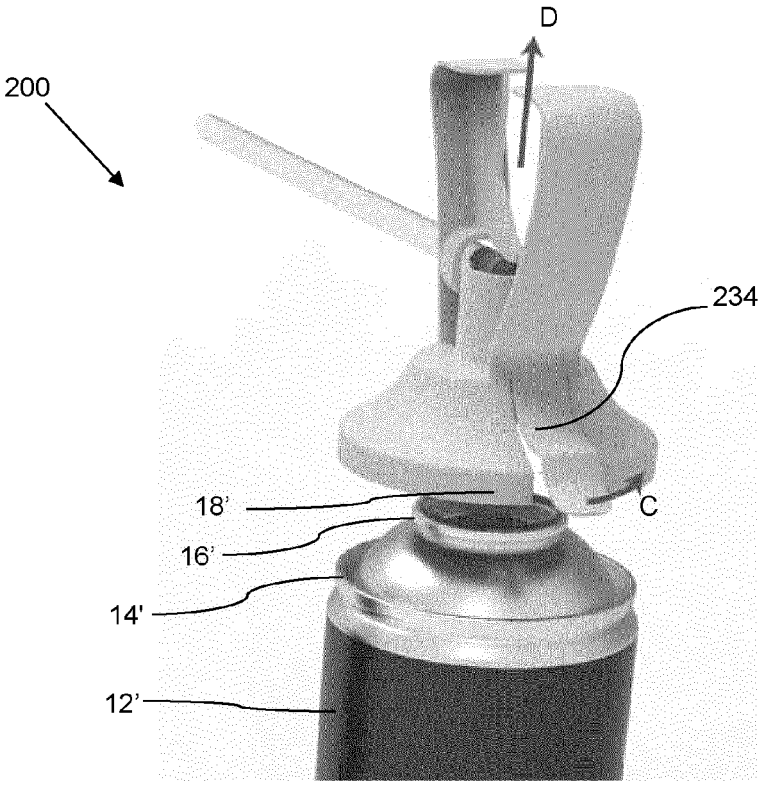


Figure 16

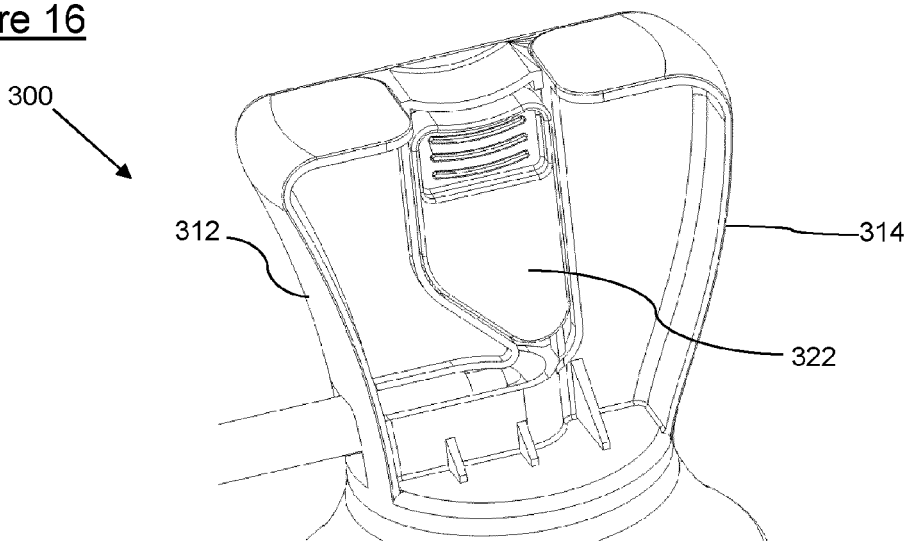


Figure 17

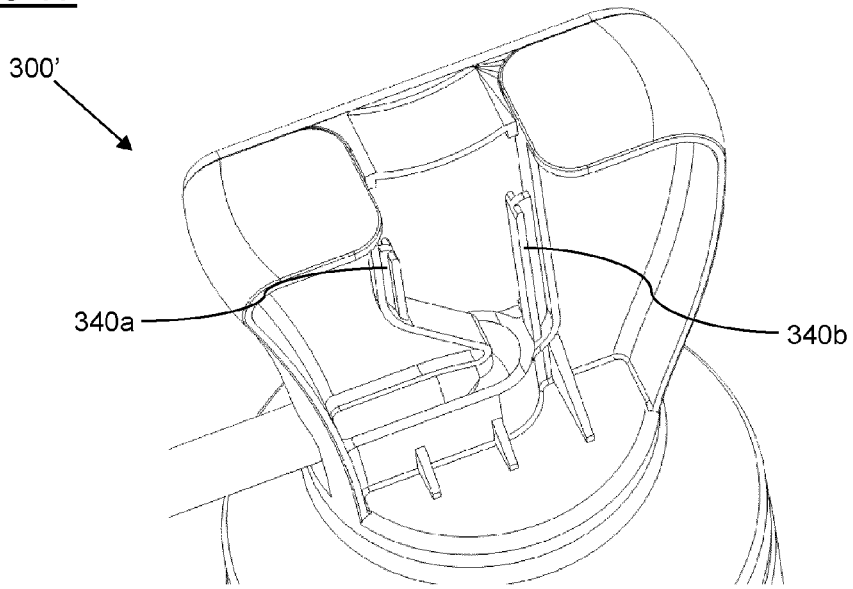


Figure 18A

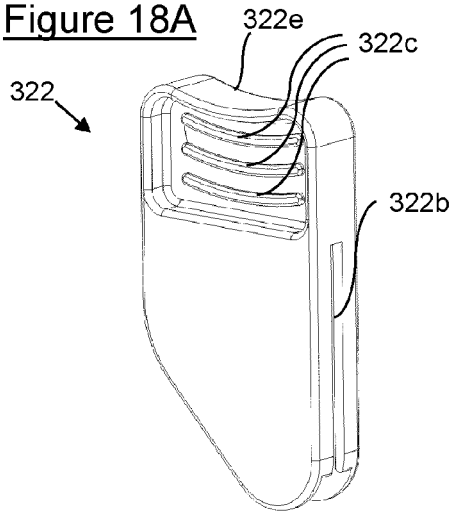


Figure 18B

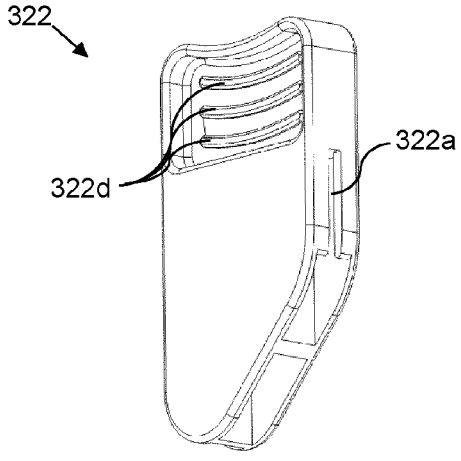


Figure 19

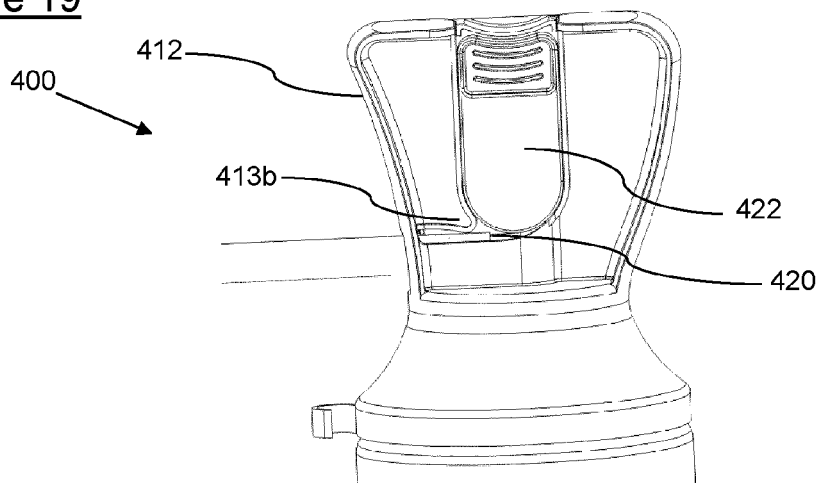


Figure 20

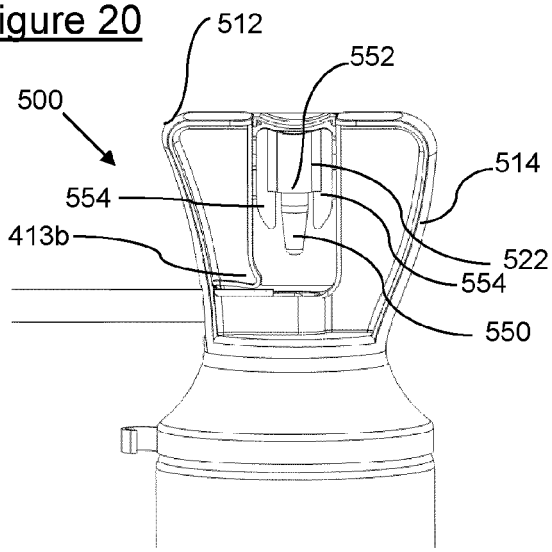


Figure 21

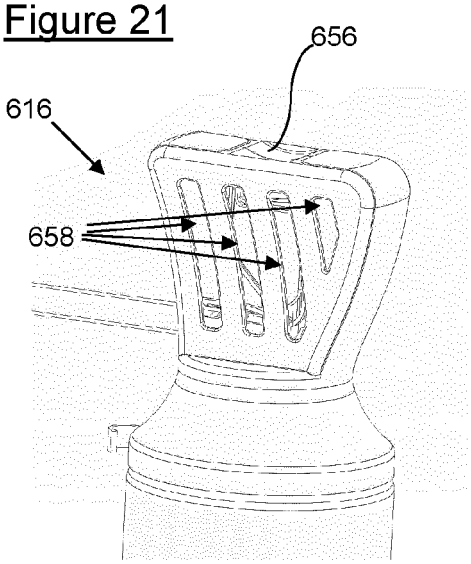


Figure 22

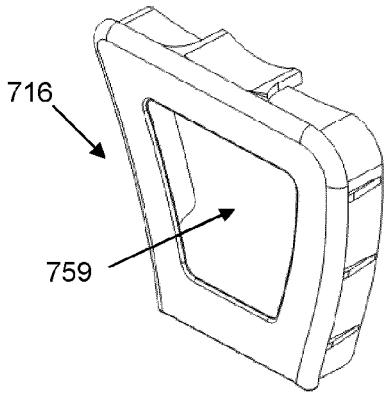
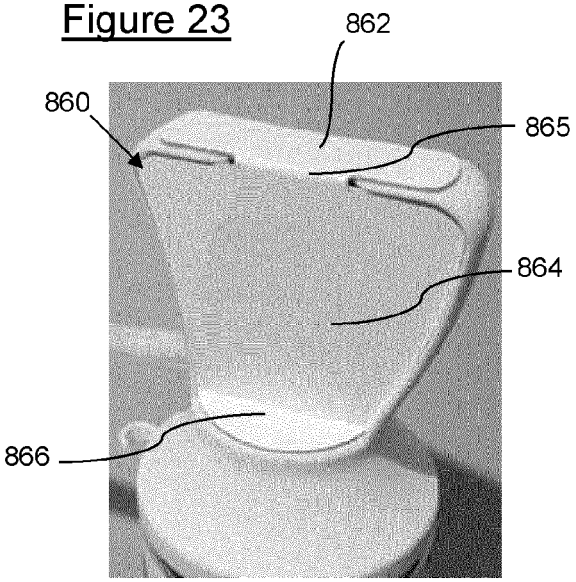


Figure 23



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EUROPEAN SEARCH REPORT

Application Number
EP 20 21 5736

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 103 720 A (BESPAK INDUSTRIES LTD [GB]) 23 February 1983 (1983-02-23) * figure 1 * -----	1-5,7-9, 12	INV. B65D83/20 B65D83/22 B65D83/30 B65D83/56 B65D83/36
X	WO 2012/052449 A2 (SOUDAL [BE]; HERMANS MARC [BE] ET AL.) 26 April 2012 (2012-04-26) * figures 2,3,4 * -----	1-4,6,12	
X	GB 2 050 159 A (FIREMASTER EXTINGUISHER LTD) 7 January 1981 (1981-01-07) * figure 1 * -----	1-4,6-9, 12	
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A	WO 2017/019604 A1 (PRECISION VALVE CORP [US]) 2 February 2017 (2017-02-02) * figures 21,22 * -----	1-13	TECHNICAL FIELDS SEARCHED (IPC) B65D

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
Munich	27 May 2021	Rente, Tanja

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

T : theory or principle underlying the invention
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D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-13

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-13

   applicator with a tab for preventing depression of the actuator

   ---

2. claims: 14, 15

   applicator with a nozzle piece and a releasable connection of the cap

   ---

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 21 5736

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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