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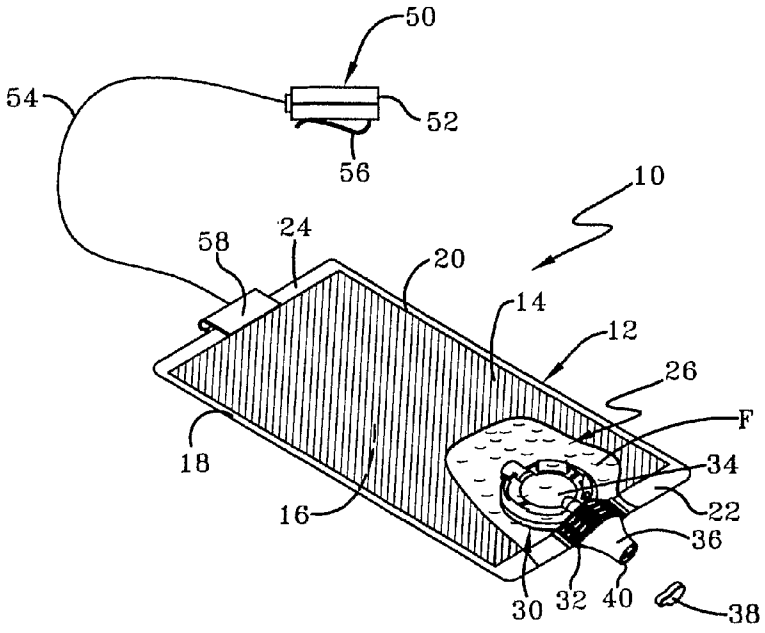
(54) **Title:** FLUID DISPENSERS FOR PERSONAL USE



(57) **Abstract:** Personal dispensers include collapsible containers that are associated with pump mechanisms for dispensing fluid from within the collapsible containers. The pump mechanisms are preferable selectively operable to dispense a unit dose of fluid. The collapsible containers are sealed such that they lose volume as fluid is dispensed. Clips and housing members for holding and wearing the personal dispensers are also provided.

WO 2008/024097 A1

FLUID DISPENSERS FOR PERSONAL USE

TECHNICAL FIELD

The present invention generally relates to fluid dispensers, and, more particularly, relates to personal, portable fluid dispensers. In specific preferred embodiments, this invention relates to portable, personal fluid dispensers that are operable to dispense a unit dose of a cleaning or sanitizing solution.

BACKGROUND OF THE INVENTION

Portable containers for dispensing cleaning or sanitizing solutions are generally known, and include semi-rigid containers that can be selectively opened or closed so that the solution retained in the container may be dispensed. These containers are herein termed "semi-rigid" because, although being formed of rigid materials, they give to pressure in order to allow their interior volume to be temporarily decreased in order to dispense some of the solution retained therein. These types of containers are very popular for carrying around hand sanitizer, hand cleaner, and hand lotion.

Hand sanitizers, hand cleaners, and hand lotions are also dispensed through the use of positive displacement pumps and wall-mounted dispensers, as generally known. Generally, these devices are not readily portable. But they do provide the beneficial feature of providing a user with a unit dose of the hand treatment solution upon activation of their dispensing mechanics. Currently, known portable dispensers do not provide a dosing function, and, thus, there exists a need in the art for a portable, personal dispenser that includes a mechanism for dispensing a unit dose of the solution contained therein.

Known portable, personal dispensers, as already mentioned, are generally made of semi-rigid materials. Inasmuch as more flexible materials might provide a less cumbersome personal dispenser, there exists a need in the art for a personal collapsible dispenser device.

Diaphragm-type pumps are known and generally employed in wall-mounted dispensers because they provide a unit dose of a cleaning solution when manipulated to dispense that solution. Various types of diaphragm (or dome) pumps are known, and a large number of them include a first one-way valve allowing solution to enter the diaphragm, upon the expansion thereof, and, a second one-way valve allowing solution to exit the diaphragm upon the compression thereof. These pumps are generally produced through multi-step processes, and are designed specifically for the wall-mounted dispenser environment. Thus, there exists a need in the art for an improved process for producing diaphragm-type pumps, and a need for modified diaphragm-type pump designs useful in portable, personal dispensers according to this invention.

In the hand cleansing/sanitizing arts, there is a growing interest in devices and methods for monitoring hand cleansing/sanitizing. Thus, there exists a need in the art for improved devices and methods for such monitoring.

SUMMARY OF THE INVENTION

In one embodiment, this invention provides a personal dispenser including a collapsible container and a pump mechanism. The collapsible container has an internal volume defined by flexible walls, and holds a fluid for dispensing. The pump mechanism is partially retained within the internal volume, and it is user-operated by manipulation through the flexible walls. The pump mechanism includes a dispensing nozzle that extends externally of the collapsible container, such that operating the pump mechanism dispenses at least some of the fluid from within the internal volume through the dispensing nozzle. The fluid dispensed may be virtually any desired fluid, and it is envisioned that hand-treatment fluids such as soaps, foamed soaps, sanitizers and lotions will be particularly desired.

In another embodiment, this invention provides a personal dispenser including a collapsible container and a pump mechanism, which includes a

collapsible dosing chamber that defines a dose volume. The collapsible container has an internal volume defined by flexible walls, and holds a fluid for dispensing. The pump mechanism communicates between the internal volume and an opening provided for dispensing fluid. An inlet communicates between the internal volume of the collapsible container and the dose volume, and an outlet communicates between the dose volume and the opening for dispensing fluid. Operating the pump mechanism by direct hand manipulation of the collapsible dosing chamber results in the dispensing of at least some of the fluid from within the dose volume through the dispensing nozzle. The personal dispenser of this embodiment is preferably carried by an individual for personal use, and, in preferred embodiments, includes means for attaching the personal dispenser to an individual.

In yet another embodiment, this invention provides a personal dispenser including a collapsible container having flexible walls defining an internal volume holding a fluid for dispensing; a dispensing nozzle having an opening for dispensing fluid and an outlet communicating between the internal volume of the collapsible container and the opening for dispensing fluid; and a one-way valve in the outlet that permits dispensing of the fluid at the opening and prohibits air from entering the collapsible container through the outlet, wherein the one-way valve responds to an increase in pressure in the outlet to permit dispensing of the fluid. The increase in pressure at the outlet is achieved by squeezing the collapsible container. Although not limited thereto, this embodiment preferably includes a housing member having a dispensing nozzle aperture and a push plate. The housing member selectively receives the collapsible container such that the push plate overlies the collapsible container and the dispensing nozzle extends outwardly of the housing member through the dispensing nozzle aperture. Pressing on the push plate presses on the collapsible container and increases the pressure against the collapsible container to cause dispensing of the fluid through the one-way valve.

With the personal dispensers of this invention, a method for monitoring the maintenance of a sanitized work environment is also provided. This method comprises the steps of providing a plurality of personal disposable personal dispensers to workers at said work environment, wherein said personal dispensers hold a plurality of unit doses of hand sanitizing fluid; monitoring, on a consistent periodic basis, the number of empty personal dispensers exchanged for new personal dispensers; determining, after a plurality of said monitoring steps, an average number of exchanges that correlates with a sanitized work environment; and after said step of determining an average number of exchanges that correlates with a sanitized work environment, comparing the number of empty personal dispensers exchanged in subsequent said steps of monitoring with the average number of exchanges.

This invention also provides a method for creating a pump mechanism having an inlet and outlet path communicating with a dosing chamber, wherein both the inlet and outlet paths include one-way valves, the method comprising the steps of molding a first half of a body portion from rigid material, the first half of the body portion providing a first half of an inlet path, a first half of an outlet path, and a dosing chamber aperture; molding a second half of a body portion from rigid material, the second half of the body portion providing a second half of an inlet path, a second half of an outlet path, and a dosing chamber aperture; over molding a flexible material on the first half of the body portion to provide a first half of a duct bill valve in the inlet path, a first half of a duct bill valve in the outlet path, and a first half of a dosing chamber extending through the dosing chamber aperture; over molding a flexible material on the second half of the body portion to provide a second half of a duct bill valve in the inlet path, a second half of a duct bill valve in the outlet path, and a second half of a dosing chamber extending through the dosing chamber aperture; and joining the first and second halves of the body portion such that said first and second halves of the inlet path create a complete inlet path with a duct bill valve therein, said first and second halves of

the outlet path create a complete outlet path with a duct bill valve therein, and said first and second halves of a dosing chamber create a complete dosing chamber.

A method for creating a pump mechanism having an inlet and outlet path communicating with a dosing chamber, wherein both the inlet and outlet paths include one-way valves, the method comprising the steps of providing a mold having an inside dimension configuration that provides a domed dosing chamber shape, an inside-out duck bill valve shape extending from the domed dosing chamber shape at an open end of the duck bill valve shape and extending to a closed end of the duck bill valve shape, and an outlet conduit shape extending from the domed dosing chamber shape at an open end of the outlet conduit shape and extending to an open fill end of the outlet conduit shape; placing a tube of plastic material in the mold; blowing air through the open fill end of the outlet conduit shape of the mold to force the tube of plastic material to contact the inside dimensions of the mold, and thereby forming a pump mechanism having a dosing chamber from which a sealed inside-out duck bill valve extends and from which an outlet conduit extends; removing the pump mechanism from the mold; and pushing the inside-out duck bill valve inside of the dosing chamber to create an inlet conduit closed by a duck bill valve.

This invention also provides a clip device comprising a first clamp member having a first grip portion and a catch; a second clamp member having a second grip portion and a latch, said second clamp member being joined to said first clamp member at a hinge such that said first and second grip portions are opposed to one another and said latch is opposed to said catch, wherein said first and second grip portions move about said hinge to make contact with one another and said latch engages said catch when said first and second grip portions make contact.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a personal dispenser in accordance with one embodiment of this invention, with a portion removed to show a portions of a pump mechanism and fitment element of that embodiment;

Fig. 2 is a perspective view of an embodiment of a clip device useful for converting personal dispensers in accordance with this invention to wearable personal dispensers that can be carried on the clothing (or elsewhere) of an individual;

Fig. 3 is a side view of the clip device of Fig. 2;

Fig. 4 is a top view of a general embodiment for a pump mechanism useful for this invention, showing generic one-way valves;

Fig. 5 is a perspective view of a body member of a pump mechanism in accordance with this invention;

Fig. 6 is a perspective view as in Fig. 5, but shown with an over mold portion of flexible material providing half portions of one-way valves and the dosing chamber;

Fig. 7 is a perspective view of a pump mechanism formed by mating two halves of a pump mechanism as shown in Fig. 6;

Fig. 8 is a perspective view of an alternative pump mechanism that may be molded in one shot;

Fig. 9 is a side view of the pump mechanism of Fig. 8, but shown before an inlet thereof is inserted into the dosing chamber;

Fig. 10 is a perspective view of a personal dispenser in accordance with another embodiment of this invention, with a portion removed to show the absence of particular pump mechanisms;

Fig. 11 is a perspective view of a badge holder for use with personal dispensers of this invention, shown open for receipt of a personal dispenser;

Fig. 12 is a perspective view of the badge holder of Fig. 11, shown closed around a personal dispenser, and showing the badge-holding capabilities provided on a badge portion;

Fig. 13 is a perspective view of the badge holder of Fig. 11, shown closed around a personal dispenser, and showing the push plate aspects of the badge holder provided on a plate portion;

Fig. 14 is a perspective view in partial cross section of an alternative embodiment of a pump mechanism having an automatic on/off cap that automatically opens when fluid is being dispensed, and automatically closes when dispensing is complete;

Fig. 15 is a perspective view of the pump mechanism of claim 14, shown in an open position to allow for dispensing of fluid; and

Fig. 16 is a dual clip device embodiment based on the clip device of Figs. 2 and 3.

PREFERRED EMBODIMENT FOR CARRYING OUT THE INVENTION

Referring now to Fig. 1, an embodiment of a personal dispenser according to this invention is shown and designated by the numeral 10. Personal dispenser 10 includes a collapsible container 12 having flexible walls 14 and 16 (opposed to wall 14) sealed at mating edges, shown at side edges 18 and 20, front edge 22, and rear edge 24. A potion of wall 14 is removed to show a portion of the interior volume of collapsible container 12 and the fixing of a fitment 32 at front edge 22, as, for example, by heat sealing and/or adhesive. Collapsible container 12 defines an internal volume 26 that retains any desired fluid F. Collapsible container 12, as its name implies, is collapsible such that its internal volume 26 can decrease through the movement of the walls that define that volume. Collapsible container 12 is thus not limited to the flexible bag type container shown, and may be virtually any container capable of collapsing upon

the removal of fluid from the internal volume. Pump mechanism 30 is fixed to collapsible container 12 at fitment 32 (sealed at front edge 22, the portion of edge 22 that would cover and secure fitment 32 being removed in the Fig.), such that collapsible dosing chamber 34 resides within internal volume 26, surrounded by fluid F, while dispensing nozzle 36 extends exteriorly of internal volume 26. Pump mechanism 30 may thus be considered to be partially retained within internal volume 26. Dispensing nozzle 36 preferably includes an on/off cap 38 that communicates with an opening 40 in dispensing nozzle 36. In the embodiment of Fig. 1, a duckbill valve resides in dispensing nozzle 36 to allow for selective dispensing of fluid F. This will be explained more fully below, and this invention is not limited by the type of valves employed. In other embodiments, different on/off cap configurations may be employed, such as those generally known from sports/drink bottle arts.

Dosing chamber 34 may be manipulated through flexible walls 14, 16 in order to dispense fluid F through opening 40, when on/off cap 38 is positioned to allow for the dispensing of fluid F. An individual can access and physically manipulate pump mechanism 30, particularly at dosing chamber 34, to dispense fluid as desired. And in this particular embodiment, dosing chamber 34 defines a dose volume, such that the squeezing of dosing chamber 34 dispenses a unit dose of fluid. This will be seen more fully below when the particular pump mechanism of this embodiment (pump mechanism 30) is disclosed in more detail. Notably, collapsible container 12 is sealed at all edges such that, each time fluid is dispensed, internal volume 26 is reduced by the volume of the unit dose, i.e., substantially by the volume of dosing chamber 34, although it will be appreciated that the squeezing of dosing chamber 34 may fail to expel the entire volume of dosing chamber 34. Because collapsible container 12 is sealed and collapses when fluid is dispensed, the personal dispenser 10 (and other embodiments disclosed herein) has the added benefit of being capable of dispensing fluid in virtually any orientation (which may be distinguished from prior art dispensers that must be

oriented in a particular way, typically against gravity, to dispense properly). After a substantial number of unit doses have been dispensed, collapsible container 12 will be fully collapsed and substantially empty of fluid F, at which time it may be thrown away.

The fluid dispensed may be virtually any desired fluid, and it is envisioned that hand-treatment fluids such as soaps, foamed soaps, sanitizers and lotions will be particularly desired.

In Fig. 1, one means for providing personal dispenser 10 as a wearable personal dispenser is shown as lanyard device 50. Lanyard device 50 includes a housing 52 that retains a retractable spool member that, in a known manner, can selectively allow for the extension or retraction of cord 54. Housing 52 carries a common clip 56 that, in a known manner, may be attached to an individual's clothing or another article, as desired. Cord 54 is either fixed or removably attached to collapsible container 14, as generally shown at edge 24 at generic clamp mechanism 58. Having disclosed an embodiment for a lanyard device with specific reference to the personal dispenser embodiment of Fig. 1, it should be appreciated that lanyard devices such as these and obvious variants thereof may be employed with other personal dispenser embodiments hereafter disclosed. This is also true for the clip device of Figs. 2 and 3, which is disclosed directly below.

Referring now to Figs. 2 and 3, a clip device is shown and designated by the numeral 70 and is employed to associate a personal dispenser with an individual's clothing (i.e., to provide a wearable personal dispenser) either with or without lanyard device 50. Although this invention is not limited thereto, it is preferred that clip device 70 be created as a one-piece molded plastic clamp. Clip device 70 includes opposed clamp members 72 and 74, joined at hinge 76. Although virtually any appropriate hinge may be employed as hinge 76, in this preferred embodiment, the joinder of clamp member 72 and 74 creates a hinge at 76 simply due to the nature of the material from which the clip device 70 is made, particularly the shape memory thereof. This will be generally appreciated by those

of ordinary skill in the art. Clamp members 72 and 74 each include teeth 78 and 80, respectively, and, as can be seen in Fig. 3, these teeth are offset to mate when clamp members 72 and 74 are brought together. For purposes of employing clip device 70 with a personal dispenser, such as personal dispenser 10 or any other personal dispenser herein disclosed, teeth 78 and 80 are provided to grip an edge of the collapsible container, as shown in Fig. 3, wherein rear edge 24 of the personal dispenser 10 is shown gripped between teeth 78 and 80. Teeth 78, 80 may be over molded with an elastomer to prevent damage to the item (edge of container) gripped between teeth 78, 80. Because hinge 76 serves to urge clamp members 72 and 74 away from each other, latch 82 is provided extending from clamp member 72 toward clamp member 74, in juxtaposition with catch member 84 in clamp member 74. As can be seen in Fig. 3, when clamp members 72 and 74 are brought together to clamp teeth 78 and 80 on an item, beveled tip 85 of latch 82 extends through catch 84 and locks clip device 70 in the position shown therein. Latch 82 is preferable made of semi-rigid material such that tip 85 may be disengaged from catch 84 by pushing on tip 85 to align it with catch 84 so that hinge 76 forces teeth 78 and 80 apart. Latch 82 may include multiple beveled sections to lock with catch 84 at various clamp member 72, 74 positions in order to accommodate various thicknesses of items clamped. A clip 86 is provided, as in lanyard 50, to fix clip device 72 on an article of clothing or elsewhere. Alternatively, a lanyard device, like lanyard 50, could be affixed to clip device 70 to provide a wearable personal dispenser. In other embodiments, clip device 70 may include a badge receiver 88 that could serve to hold an identification badge through a tight tolerance fit, i.e., the receiver 88 would be sized slightly smaller than the thickness of the badge, and the receiver 88 would yield to the insertion of the badge edge therein.

An alternative embodiment of a clip device is shown in Figure 16, where a dual clip device is shown and designated by the numeral 700. It will be appreciated that dual clip device 700 is basically two clip devices 70 joined

together proximate their hinges 76. Because of this, like parts will receive like numerals, but increased by 700 and designated as "A" or "B." It will be appreciated that, in the embodiment of Fig. 16, clip 86 has been removed, but such clip may be provided, as desired. However, one of the clip devices 70A or 70B may effectively take the place of clip 86. Similarly, receiver 88 is removed, but might be included, as desired. That is, one clip device, such as clip device 70A, may be used to secure a personal dispenser, while the other clip device 70B may be used to affix the personal dispenser to an individual's clothing. The two clip devices, 70A, 70B are joined through a joinder member 790. This member may be rigid or elastic, which would allow for relative rotational movement between the two clip devices 70A, 70B. Alternatively, joinder member 790 may join clip devices 70A, 70B through a ball-and-socket type rotational feature. Other physical structures for providing relative rotational movement may also be employed.

Referring now to Fig. 4, a general embodiment of pump mechanism 30 is more particularly disclosed. Those portions already disclosed are numbered as they were in Fig. 1, and this figure and discussion serve to more fully disclose the functioning of pump mechanism 30. Particularly, this figure is provided to show one-way valves and the inlets and outlets to and from dosing chamber 34. Inlet 90 communicates between the exterior of pump mechanism 30 and the interior of dosing chamber 34. With reference to Fig. 1, it can be seen that inlet 90 communicates between the interior volume of collapsible container 14 and the interior of dosing chamber 34, hereinafter termed the "dose volume." One-way valve 92 is provided in inlet 90 and only allows for the flow of fluid from outside pump mechanism 30 to the dose volume. Outlet 94 communicates between the dose volume and the opening in dispensing nozzle 36, and one-way valve 96 only allows for the flow of fluid from the dose volume to opening 40, i.e., one-way valve 96 only allows fluid to be dispensed from dosing chamber 34. As is generally known in the art, and as will be more fully understood with respect to Figs. 5-7 below, dosing chamber 34 is provided as a flexible diaphragm, such that, when it is

squeezed by a user, its volume will decrease, forcing its contents through one-way valve 34 and out opening 40, and, when released from such a collapsed position, will expand. When expanding in this manner, fluid F will be drawn into dosing chamber 34 through inlet 90 and one-way valve 92. Thus dosing chamber 34 may be repeatedly squeezed and expanded to selectively dispense unit doses of fluid.

Dosing pump mechanisms and the provision of one-way valves therein are generally known. Popular one-way valves in dosing pump mechanisms of the type disclosed and employed herein include floating ball check valves, wherein balls are biased to open or close an inlet or outlet passage and respond to pressure applied to the dosing chamber to allow for proper transmission of fluid from outside the dosing chamber, into the chamber, and from there, out the outlet. In other pump mechanisms, one or more flexible, typically elastomer, flaps extend from the dosing chamber to block inlet and/or outlet passages, with the manipulation of the dosing chamber serving to affect or remove such blockage to allow for the proper transmission of the fluid for dispensing. It will be appreciated that these and other pump mechanisms may be employed in accordance with the teachings herein.

Referring now to Figs. 5-7, a method for forming a pump mechanism such as pump mechanism 30 is shown. First, as shown in Fig. 5, a body portion is molded from preferably rigid materials. Body portion 100 includes at least one female aperture 102 and at least one male protrusion 104. In the embodiment shown, two female apertures 102 are shown, as well as two male protrusions 104. Notably, female apertures 102 are juxtaposed with male protrusions 104 along center line C of body portion 100. This construction will allow two such body portions 100 to be mated together through the fixed mating of male protrusions 104 with female apertures 102. Body portion 100 also provides half of fitment 32, as designated at the numeral 106, provides half of inlet 90, as shown at the numeral 108, provides half of outlet 94, as shown at numeral 110, and provides

half of dispensing nozzle 36, as shown at number 112. Body portion 100 also provides a dosing chamber aperture 114.

After creating such a body portion 100, an over mold portion 116 is molded in a second shot using a highly flexible material, such as an elastomer. As can be seen in Figs. 6 and 7, over mold portion 116 extends through dosing aperture 114 to provide half of dosing chamber 34, as at the numeral 118. Additionally, over mold portion 116 provides half of one-way valve 92 and half of one-way valve 96, as designated at 120, 122, respectively. More particularly, in accordance with the embodiment of Figs. 5-7, half of a duckbill-type valve is provided at 120 and 122.

With two such body portions 100, each containing an over mold portion 116, as shown in Fig. 6, a completed pump mechanism may be provided, as in Fig. 7, simply by joining those two portions at female apertures 102 and male protrusions 104. By joining these two halves, two one-way duckbill valves are created at one-way valve 92 and one-way valve 96, and the dosing volume is created. Joining the two over molded parts can be accomplished by other locking features, such as different male/female matings, or, in the alternative, melt bonding or adhesive bonding and the like.

Although this invention is not to be limited to any particular type of pump mechanism, the pump mechanism just disclosed, as well as the pump mechanism that will now be disclosed with reference to Figs. 8 and 9, are believed to be particularly useful and beneficial inasmuch as they provide dosing capabilities, and can be economically produced. In Figs. 8 and 9, an alternative embodiment of a pump mechanism is shown and designated by the numeral 200. Except for on/off cap 208 and outlet valve 206, this pump mechanism is beneficially molded in one shot. More particularly, with reference to Fig. 9 a dosing chamber 202 is molded having an outlet 204 to which a duckbill one-way valve outlet 206 is attached in an after-mold step. On/off cap 208 is configured to snap over one-way valve 206 to prevent contamination of the tip thereof. A

fitment 210 is molded along the length of outlet 204. As can be seen in Fig. 9, an inlet 212 is first molded to extend externally of dosing chamber 202, with a flared end 214. This externally extending inlet 212 is then physically pushed to reside inside of dosing chamber 202 such that the flared end 214 creates a one-way duckbill valve 216. When dosing chamber 202 is squeezed, fluid within dosing chamber 202 is forced out of duckbill valve 206, and when pressure is released to expand dosing chamber 202, fluid is drawn in through inlet 212 and duckbill valve 216 to fill dosing chamber 202. Fitment 210 can be secured to a collapsible container as already disclosed, thus providing a personal dispenser functioning like those already disclosed.

In a method for forming the pump mechanism 200, a blow molding technique is employed. A mold is provided having inside dimensions that provide the shape of pump mechanism 200 from an open end at end 218 of outlet 204 to a closed end 220 at inside-out duck-bill valve 216. A tube of plastic material is placed in the mold, as generally known, and air is blown therein through opening 218 to force the plastic to contact the inside diameter of the mold. After the plastic material has cooled a degree sufficient for removing it from the mold, it is removed, and the closed end 220 of valve 216 is cut so as to provide an opening, as indicated at the numeral 222 in Fig. 8. This inside out valve 216, with its flared end 214, is pushed inside of dosing chamber 202, as seen in Fig. 9, thereby forming an inlet conduit closed off by a duck-bill valve. Valve 206 is fixed to the open end 218 of outlet 204 in a post-mold operation, and an on/off cap 208 may be placed thereover.

In Fig. 10, an embodiment of a personal dispenser is shown and designated by the numeral 300. Dispenser 300 includes collapsible container 312, and, rather than having a pump mechanism with a dosing chamber, is fitted at fitment 332 to a dispensing nozzle 336 having an outlet communicating between the internal volume of collapsible container 312 and an opening at the end of dispensing nozzle 336. The flow through this outlet is regulated by a one-way

valve, preferably a duckbill valve 340. In this embodiment, collapsible container 312 only needs to be squeezed until the pressure placed on duckbill valve 340 is sufficient to open that valve and allow fluid within collapsible container 312 to exit at the opening of dispensing nozzle 336. An on/off cap 338 may be employed as another embodiment, and different one-way valves may also be employed.

In Figs. 11-13, a badge holder that may be employed with personal dispensers made in accordance with this invention is shown and designated by the numeral 400. Badge holder 400 includes a housing member 410 made up of a plate portion 412 and a badge portion 414 preferably connected by a hinge 416. Each portion 412, 414 provides part of a dispensing nozzle aperture 418, and housing member 410 selectively receives a collapsible container of a personal dispenser in accordance with this invention, with the dispensing nozzle portion extending through this dispensing nozzle aperture 418. Plate portion 412 and badge portion 414 connect at latch 417 and catch 419. In one embodiment, a push plate 420 in plate portion 412 is provided to overly the collapsible container of a personal dispenser such as that disclosed in Fig. 10, and pressing on push plate 420 presses on the collapsible container and increases the pressure against one-way valve 340, causing fluid to be dispensed. Badge portion 414 provides groove 422 for retaining a badge B or other identification card such as those typically provided to employees in various industries. Push plate 420 is fixed to plate portion 412 by a resilient material 424 so that push plate 420 may move relative thereto to increase pressure on a collapsible container. As an alternative embodiment, push plate 420 may be made smaller and placed closer to dispensing nozzle aperture 418, and, in such an embodiment, personal dispensers employing dosing chamber pump mechanisms such as those disclosed above could be placed in these alternative badge holders, with the push plate acting upon the dosing chamber. In yet other embodiments, the push plate 420 can be completely eliminated, allowing for direct hand manipulation of either the collapsible container or the pump mechanism to dispense fluid. One or more clip apertures 426 are provided for use

in securing badge holder 400 to clothing, as, for example, by a lanyard and a clip device as in Fig. 1.

An alternative "automatic" on/off cap concept is shown in Figs. 14 and 15. These figures provide an exploded view of the outlet area and pump mechanism of a personal dispenser employing a dosing chamber. The on/off cap disclosed in the description of these figures is "automatic" in the sense that the outlet of the pump mechanism is closed when the pump mechanism is not being actuated, and is automatically opened as the pump mechanism is manipulated to dispense fluid. More particularly, a pump lever 60 is pivotally connected to cap 61 at fulcrum 62. Pump lever 60 overlies dosing chamber 34 at pump end 60', and provides an outlet seal 63 at outlet end 60". Pump lever 60 is biased to the position shown in Fig. 14, wherein outlet seal 63 acts on valve 96 to prevent fluid from leaking or otherwise exiting the personal dispenser. Pump lever 60 may be biased by a biasing element, such as a spring, or by being molded to have a biased rest position, or by the natural tendency of the dosing chamber to return to its dome shape. By pressing on pump end 60', dosing chamber 34 is collapsed to force fluid out through one-way valve 96 (shown as a duckbill here in Figs. 14 and 15) and opening 40, while at the same time raising outlet seal 63 to uncover opening 40, thus permitting the dispensing of fluid. When pressure is released from pump end 60', pump lever 60 returns to its biased position wherein outlet seal 63 covers opening 40. This concept could also be practiced in embodiments not employing a dosing chamber.

In each embodiment including a dosing chamber pump mechanism, the pump mechanism has been shown as being carried inside the collapsible container. It will be appreciated that this invention is not limited thereto.

It is envisioned that any of the personal dispensers disclosed herein may be used in a method for monitoring the maintenance of a sanitized work environment. In accordance with such a method, a plurality of disposable personal dispensers would be provided to workers at a work environment. Each worker

would be provided with a disposable personal dispenser that holds a plurality of unit doses of hand sanitizing fluid, and each worker would be expected to periodically sanitize their hands by dispensing one or more unit doses to their hands as generally disclosed above. When a worker's disposable personal dispenser is empty, he/she would be expected to exchange the empty personal dispenser for a new personal dispenser. The rate at which workers are exchanging empty personal dispensers for new personal dispensers would be monitored, and, after a short period of time, it would be possible to determine an average number of exchanges that correlates with a sanitized work environment. For example, over the course of a few weeks or months, it might be determined that, if the workers are properly keeping their hands sanitized, there would be an average of about 100 empty personal dispensers exchanged for new personal dispensers. This average number of exchanges that correlates with a sanitized work environment would have to be determined for a given work environment, but, once determined, could be compared with the number of exchanges made in subsequent time periods, in order to determine if a sanitized work environment is being maintained. In the example already given, a subsequent determination that only 75 exchanges occurred in a given month would indicate that the work environment has not remained as sanitized as might be desired inasmuch as workers are not sanitizing their hands as often as they once were. This method provides a qualitative means for assessing sanitation of a work environment.

In light of the foregoing, it should thus be evident that the process of the present invention, providing personal dispensers, substantially improves the art. While, in accordance with the patent statutes, only the preferred embodiments of the present invention have been described in detail hereinabove, the present invention is not to be limited thereto or thereby. Rather, the scope of the invention shall include all modifications and variations that fall within the scope of the attached claims.

CLAIMS

What is claimed is:

1. A personal dispenser comprising:

a collapsible container having flexible walls defining an internal volume holding a fluid for dispensing; and

a pump mechanism user operated by manipulation through said flexible walls, and including a dispensing nozzle extending external of said collapsible container, such that operating said pump mechanism dispenses at least some of said fluid from within said internal volume through said dispensing nozzle.

2. A personal dispenser as in claim 1, wherein said pump mechanism, when operated by manipulation through said flexible walls, dispenses, at said dispensing nozzle, a unit dose of fluid.

3. A personal dispenser as in claim 2, wherein said pump mechanism includes a collapsible dosing chamber residing within said internal volume that is manipulated through said flexible walls to dispense said unit dose of fluid, said collapsible dosing chamber defining a dose volume.

4. A personal dispenser as in claim 3, wherein said pump mechanism includes:

an inlet communicating between said internal volume of said collapsible container and said dose volume;

an outlet communicating between said dose volume and an opening for dispensing fluid, said outlet extending through said dispensing nozzle;

an inlet valve in said inlet that permits said fluid to enter said dose volume upon expansion of said collapsible dosing chamber from a collapsed state; and

an outlet valve in said outlet that permits dispensing of said fluid upon collapsing said collapsible dosing chamber from an expanded state.

5. The personal dispenser of claim 2, wherein said collapsible container is sealed such that dispensing said unit dose causes said interior volume of said collapsible container to decrease substantially by said unit dose.

6. The personal dispenser of claim 3, wherein said inlet valve is a duckbill valve that opens to fluid flow in the direction into said dose volume and closes to fluid flow in the direction opposite thereto.

7. The personal dispenser of claim 6, wherein said outlet valve is a duckbill valve that opens to fluid flow from within said dose volume toward said dispensing nozzle, and closes to fluid flow in the direction opposite thereto.

8. The personal dispenser of claim 7, wherein said collapsible dosing chamber and said inlet and outlet thereof are a unitary blow-molded pump mechanism.

9. The personal dispenser of claim 7, wherein said pump mechanism is formed of two substantially identical half sections mating to form said pump mechanism through male and female mating members.

10. The personal dispenser of claim 9, wherein said half sections each comprise:

a body portion providing an inlet trough providing half of said inlet, an outlet trough providing half of said outlet, and an aperture between said inlet trough and outlet trough; and

an over mold portion of a flexible material providing half said duckbill valve in said outlet, half of said duckbill valve in said inlet, and half of said dosing chamber extending through said aperture.

11. The personal dispenser of claim 1, further comprising a fastener so that the user may carry the personal dispenser on his/her person.

12. The personal dispenser of claim 1, further comprising a housing member that selectively receives said collapsible container with at least a portion of said dispensing nozzle extending exteriorly thereof, said housing member having a push plate extending over at least a portion of said collapsible container such that pushing on said push plate pushes on said collapsible container to dispense fluid.

13. A personal dispenser comprising:

a collapsible container having flexible walls defining an internal volume holding a fluid for dispensing;

a pump mechanism communicating between said internal volume and an opening for dispensing fluid, said pump mechanism including a collapsible dosing chamber defining a dose volume, an inlet communicating between said internal volume of said collapsible container and said dose volume, and an outlet communicating between said dose volume and said opening for dispensing fluid, such that operating said pump mechanism dispenses at least some of said fluid from within said dose volume through said dispensing nozzle, wherein said pump mechanism is manipulated to dispense said fluid by direct manipulation of said collapsible dosing chamber by a hand of the user.

14. A personal dispenser comprising:

a collapsible container having flexible walls defining an internal volume holding a fluid for dispensing;

a dispensing nozzle having an opening for dispensing fluid, and an outlet communicating between said internal volume of said collapsible container and said opening for dispensing fluid;

a one-way valve in said outlet that permits dispensing of said fluid at said opening and prohibits air from entering said collapsible container through said outlet, said one-way valve responding to an increase in pressure in said outlet to permit dispensing of said fluid.

15. The personal dispenser of claim 14, further comprising:

a housing member having a dispensing nozzle aperture and a push plate, said housing member selectively receiving said collapsible container such that said push plate overlies said collapsible container and said dispensing nozzle extends outwardly of said housing member through said dispensing nozzle aperture, wherein pressing on said push plate presses on said collapsible container and increases the pressure against said collapsible container to permit dispensing of said fluid.

16. The personal dispenser of claim 15, wherein said housing member further includes an identification badge holder.

17. A method for monitoring the maintenance of a sanitized work environment comprising the steps of:

providing a plurality of personal disposable personal dispensers to workers at said work environment, wherein said personal dispensers hold a plurality of unit doses of hand sanitizing fluid;

monitoring, on a consistent periodic basis, the number of empty personal dispensers exchanged for new personal dispensers;

determining, after a plurality of said monitoring steps, an average number of exchanges that correlates with a sanitized work environment; and

after said step of determining an average number of exchanges that correlates with a sanitized work environment, comparing the number of empty personal dispensers exchanged in subsequent said steps of monitoring with the average number of exchanges.

18. A method for creating a pump mechanism having an inlet path and an outlet path communicating with a dosing chamber, wherein both the inlet and outlet paths include one-way valves, the method comprising the steps of:

molding a first half of a body portion from rigid material, the first half of the body portion providing a first half of an inlet path, a first half of an outlet path, and a dosing chamber aperture;

molding a second half of a body portion from rigid material, the second half of the body portion providing a second half of an inlet path, a second half of an outlet path, and a dosing chamber aperture;

over molding a flexible material on the first half of the body portion to provide a first half of a duct bill valve in the inlet path, a first half of a duct bill valve in the outlet path, and a first half of a dosing chamber extending through the dosing chamber aperture;

over molding a flexible material on the second half of the body portion to provide a second half of a duct bill valve in the inlet path, a second half of a duct bill valve in the outlet path, and a second half of a dosing chamber extending through the dosing chamber aperture; and

joining the first and second halves of the body portion such that said first and second halves of the inlet path create a complete inlet path with a duct bill valve therein, said first and second halves of the outlet path create a complete

outlet path with a duct bill valve therein, and said first and second halves of a dosing chamber create a complete dosing chamber.

19. A method for creating a pump mechanism having an inlet path and an outlet path communicating with a dosing chamber, wherein both the inlet and outlet paths include one-way valves, the method comprising the steps of:

providing a mold having an inside dimension configuration that provides a domed dosing chamber shape, an inside-out duck bill valve shape extending from the domed dosing chamber shape at an open end of the duck bill valve shape and extending to a closed end of the duck bill valve shape, and an outlet conduit shape extending from the domed dosing chamber shape at an open end of the outlet conduit shape and extending to an open fill end of the outlet conduit shape;

placing a tube of plastic material in the mold;

blowing air through the open fill end of the outlet conduit shape of the mold to force the tube of plastic material to contact the inside dimensions of the mold, and thereby forming a pump mechanism having a dosing chamber from which a sealed inside-out duck bill valve extends and from which an outlet conduit extends;

removing the pump mechanism from the mold; and

pushing the inside-out duck bill valve inside of the dosing chamber to create an inlet conduit closed by a duck bill valve.

20. A clip device comprising:

a first clamp member having a first grip portion and a catch;

a second clamp member having a second grip portion and a latch, said second clamp member being joined to said first clamp member at a hinge such that said first and second grip portions are opposed to one another and said latch is opposed to said catch, wherein said first and second grip portions move

about said hinge to make contact with one another and said latch engages said catch when said first and second grip portions make contact.

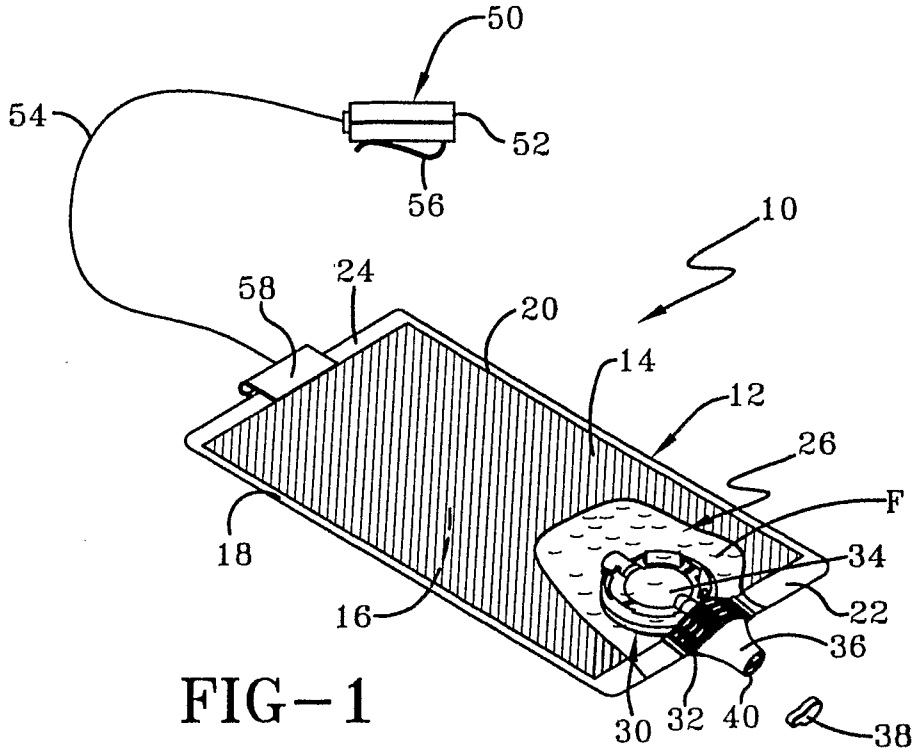


FIG-1

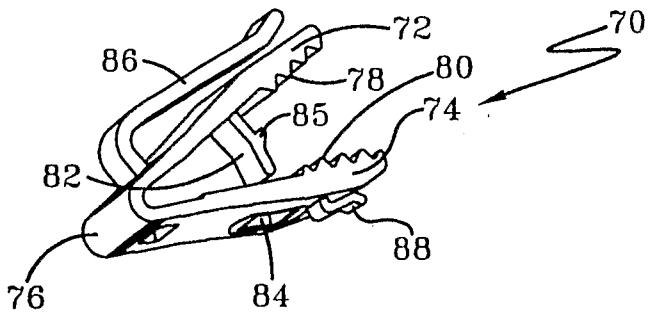


FIG-2

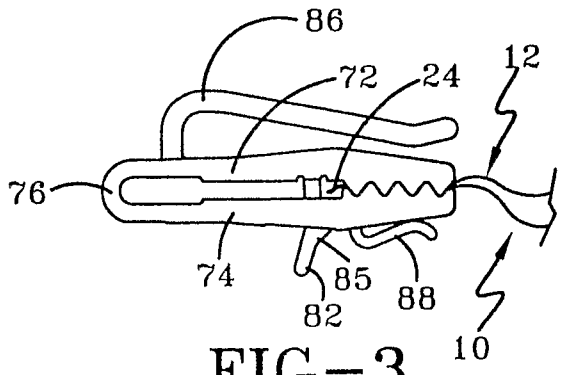


FIG-3

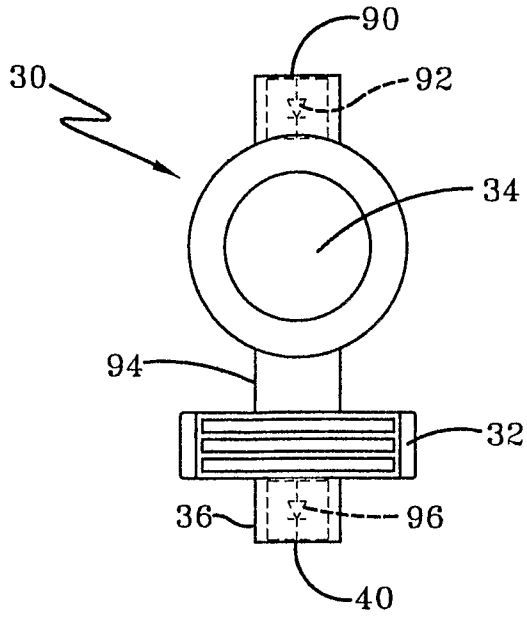


FIG-4

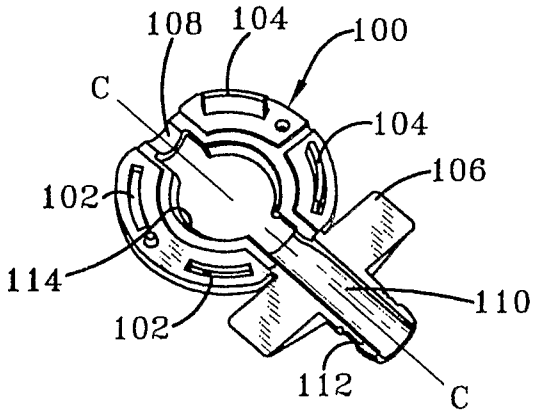


FIG-5

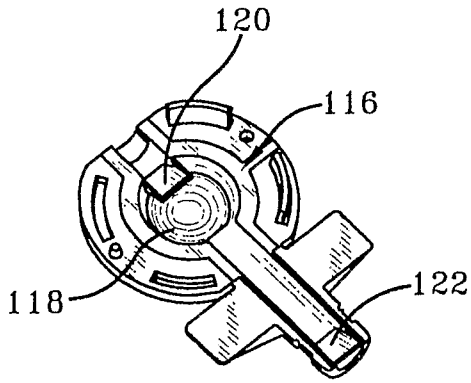


FIG-6

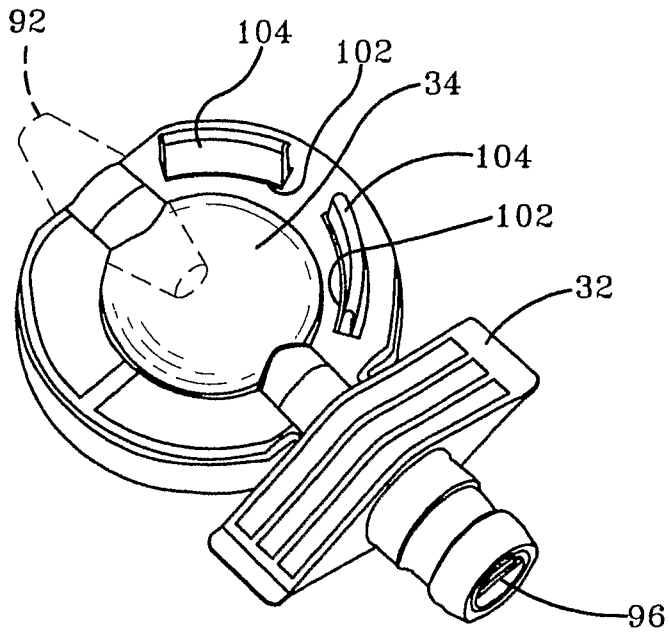


FIG-7

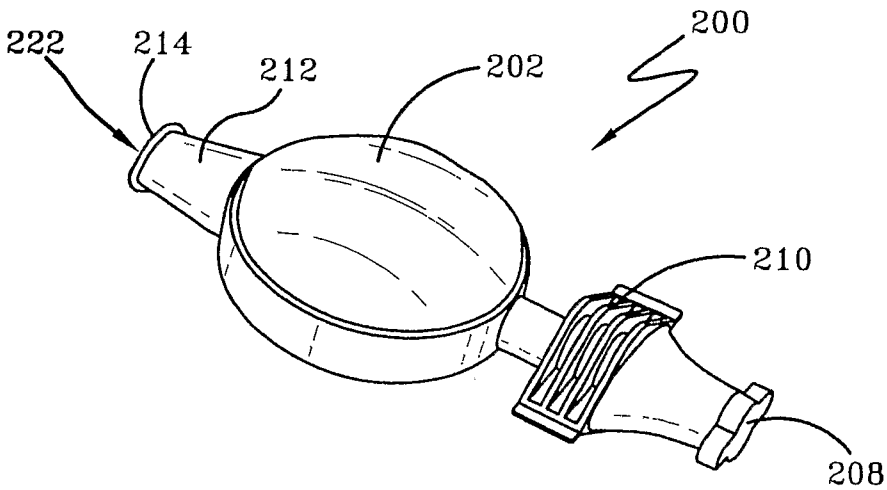


FIG-8

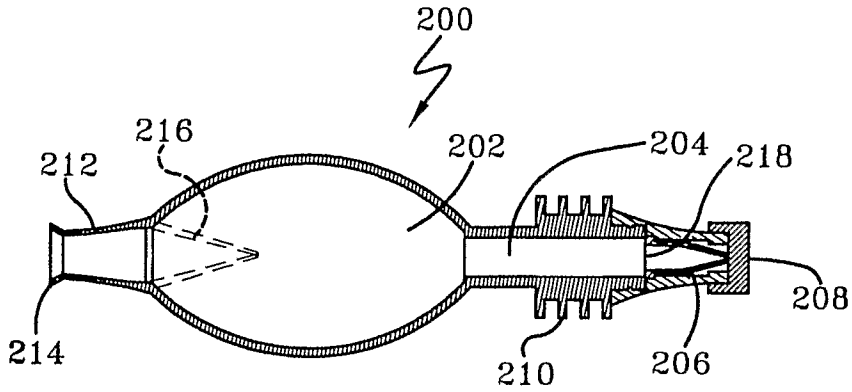


FIG-9

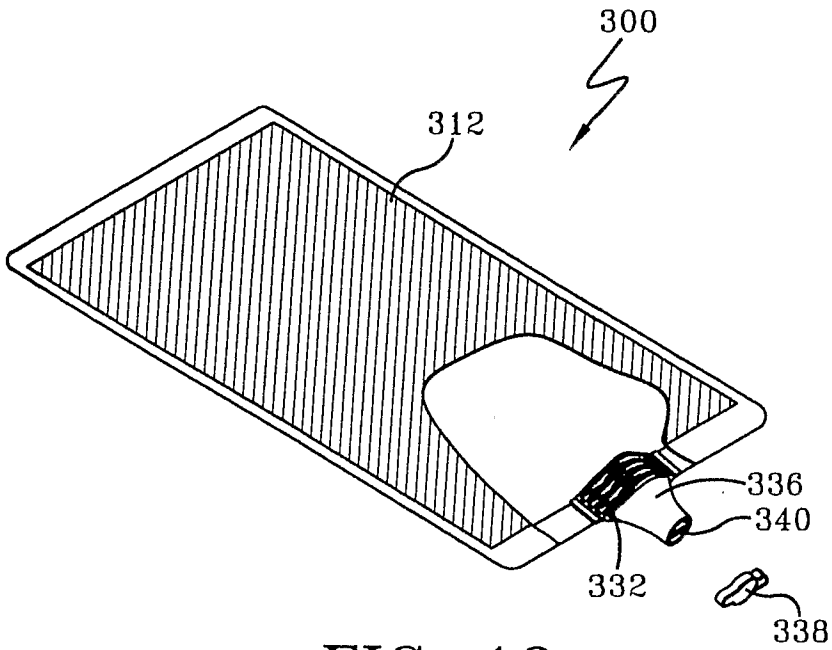


FIG-10

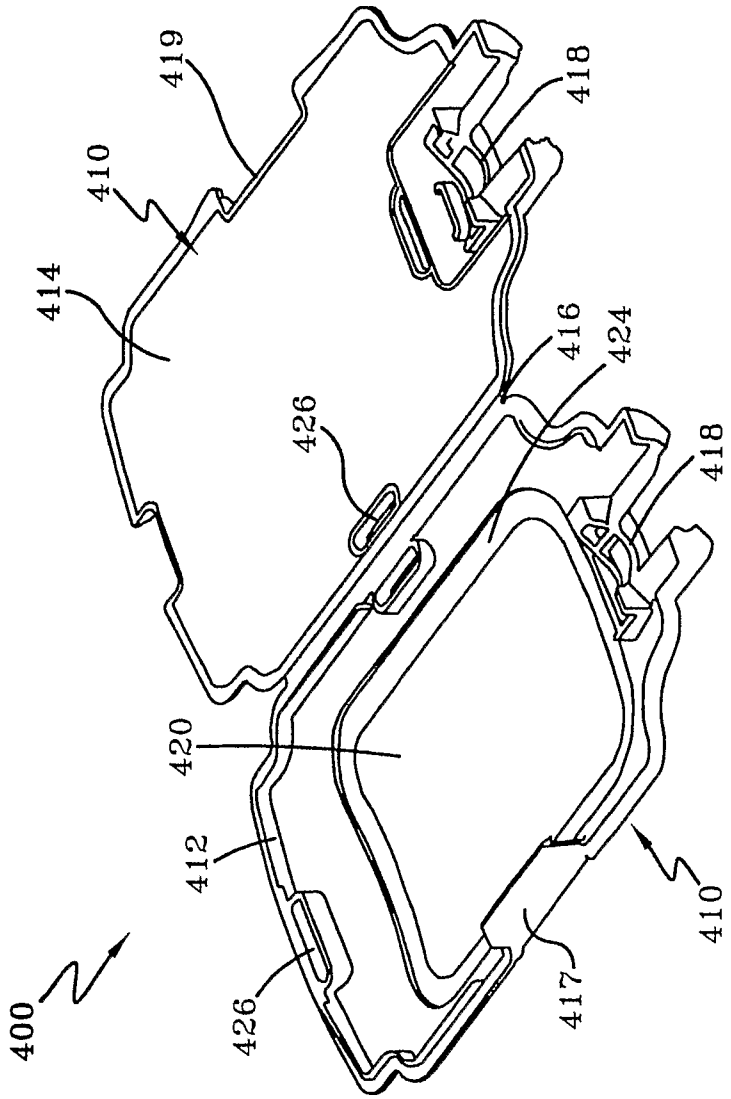


FIG-11

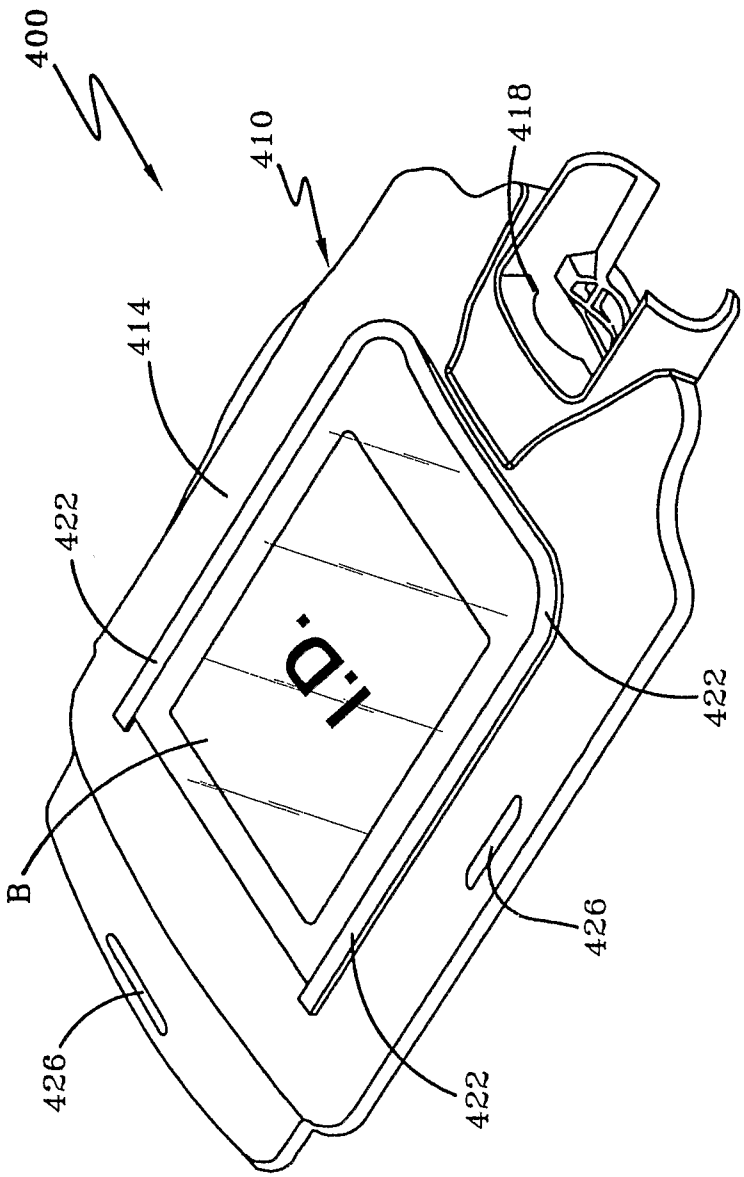


FIG-12

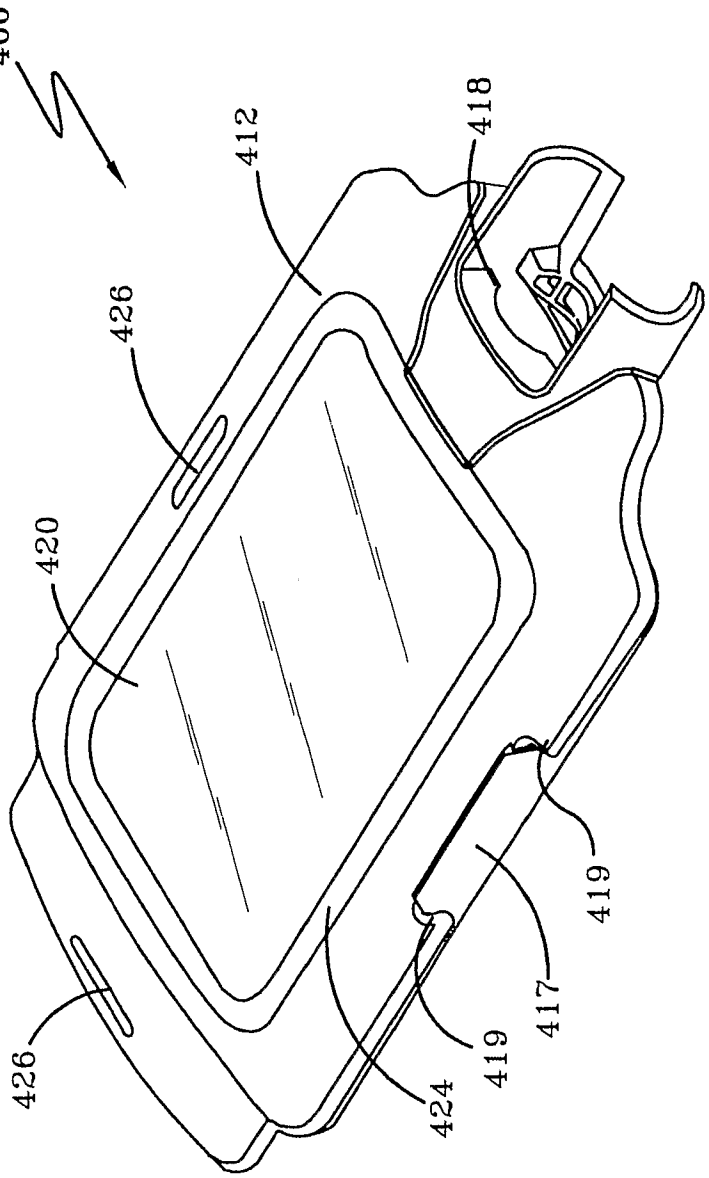


FIG-13

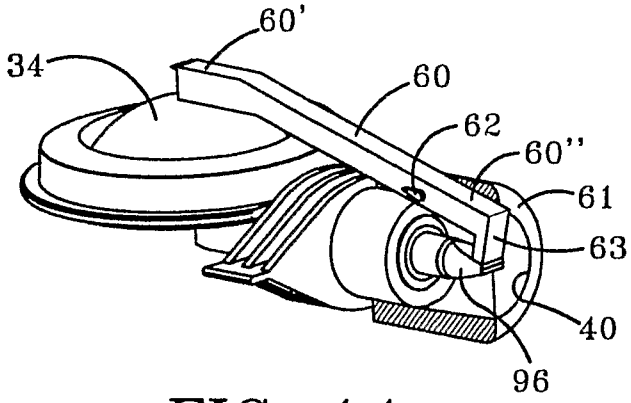


FIG-14

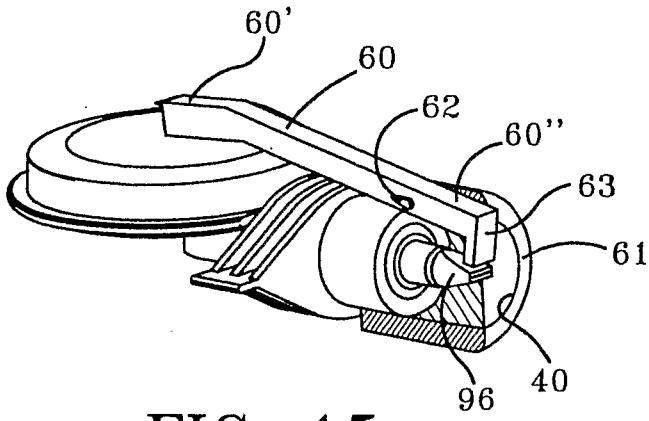


FIG-15

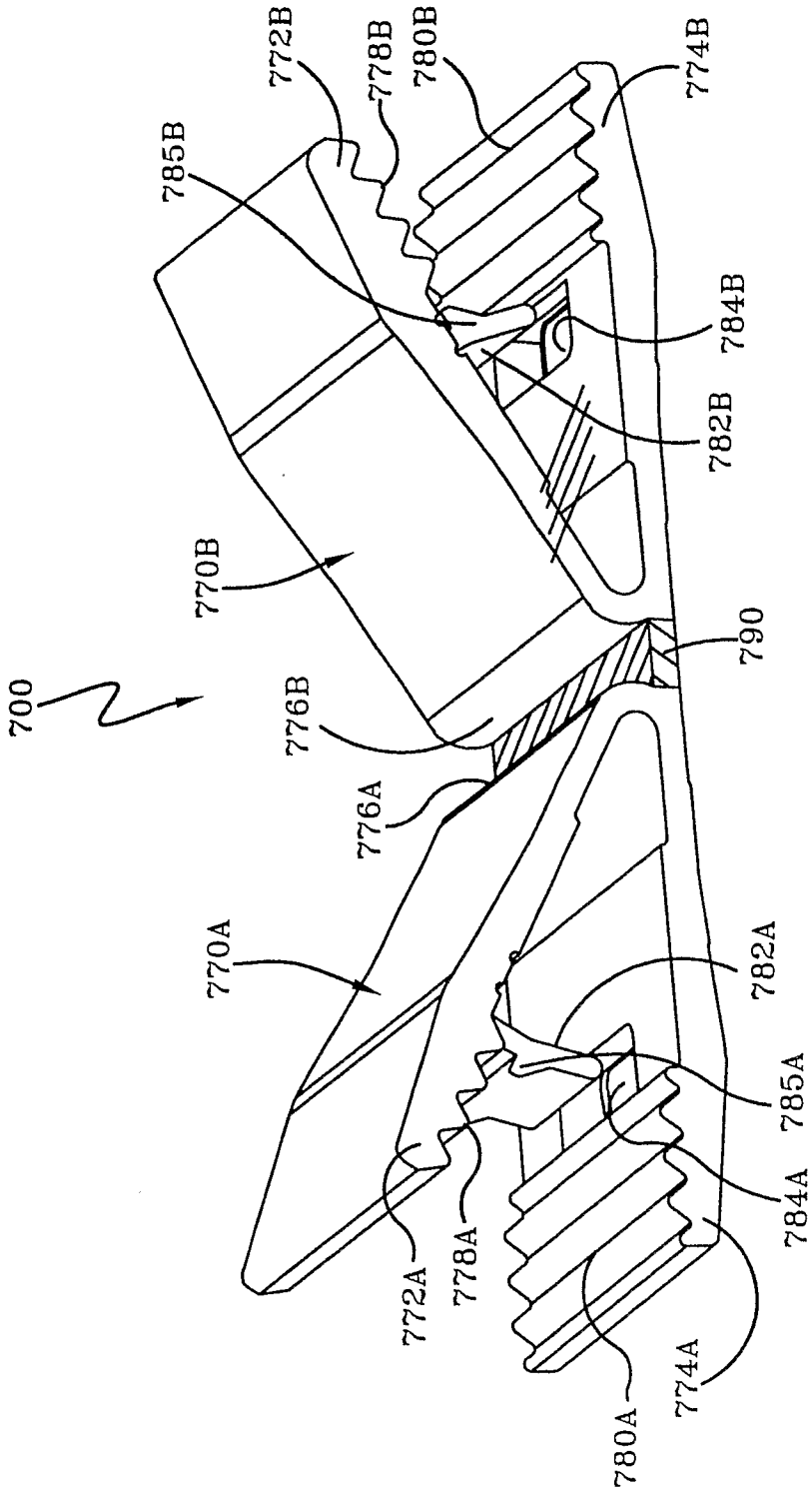

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FIG-16

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/032396

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D47/20 B65D75/58 B05B11/00 B65D35/56

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)
B65D B05B

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/082849 A (SILEX PROJECTS LTD [IL]; GENOSAR AMIR [US]) 30 September 2004 (2004-09-30)	1-8, 11-13
A	page 8, line 5 - page 13, line 23; figures 1-11	18,19
X	WO 02/16047 A (VALOIS SA [FR]; GARCIA FIRMIN [FR]; ABERGEL ALINE [FR]) 28 February 2002 (2002-02-28) page 5, line 27 - page 7, line 31; figures 1-3	1-8, 11-13
A	WO 03/097250 A (GENOSAR AMIR [IL]) 27 November 2003 (2003-11-27) page 6, last paragraph - page 8, last paragraph; figures 1-14	1-7, 11-13

☐ Further documents are listed in the continuation of Box C.

☒ 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 document 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
12 April 2007	13/09/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Derrien, Yannick

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/032396

Box 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:

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 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 additional sheet

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 an additional fee, this Authority did not invite payment of any additional fee.

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.:

1-13, 18-19

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13, 18-19

A dispenser having a collapsible container and a pump mechanism, and a method for creating such a pump mechanism

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2. claims: 14-16

A dispenser having a collapsible container and a one-way valve

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3. claim: 17

A method of monitoring the maintenance of a sanitized work environment

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4. claim: 20

A clip device

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2006/032396

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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