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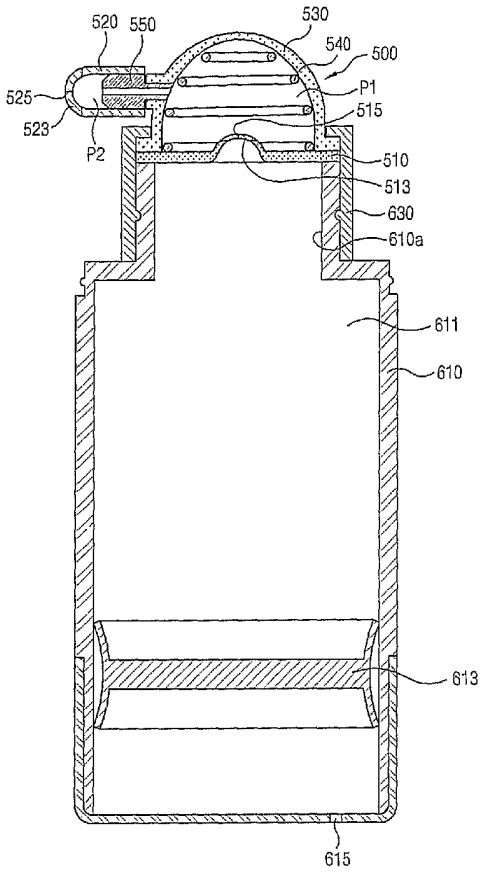
(54) **Title:** LIQUID CONTAINER WITH SIMPLE STRUCTURE



(57) **Abstract:** Disclosed is a liquid container having a pumping device with a simple structure. The liquid container has a container portion for containing liquid, a first valve installed on the opening of the container portion, a pressing portion installed on the first valve, and a second valve installed on the pressing portion. The first valve allows outflow of the liquid in the container portion, and prevents inflow of the liquid into the container portion. The pressing portion forms a pressing space on the outer , side of the first valve, and is made of soft material. The second valve allows outflow of the liquid in the pressing space, and prevents inflow of the liquid into the pressing portion. The first valve and the second valve have a protrusion protruding outward and formed with slits. The protrusion is made of soft material so. that the slits are opened and closed elastically. As the pumping device and the liquid container is constituted by a small number of parts, the manufacturing cost is low, the manufacturing process becomes simple, and the breakdown of the product is rare.

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【DESCRIPTION】

【Invention Title】

LIQUID CONTAINER WITH SIMPLE STRUCTURE

【Technical Field】

<1> The present invention relates to a liquid container, and more particularly, to a liquid container that can discharge a certain amount of liquid such as cosmetics or the like contained in the container as a user presses a button.

【Background Art】

<2> The containers for containing liquid such as cosmetics or the like are classified into a general type having the construction that merely contains the liquid, and a pumping type that discharges a certain amount of cosmetics through a nozzle by pressing a button prepared on the container. FIG. 1 shows a cosmetics container as an example of the liquid container among the conventional liquid containers with the pumping device.

<3> As shown in FIG. 1, such a liquid container has a container portion 110 for containing liquid, and a pumping device 200 for discharging the cosmetics contained in the container portion 110 toward the outside.

<4> The container portion 110 is generally has a cylinder shape. The container portion 110 forms a containing space 111 for containing the cosmetics therein, and an aperture 115 is formed on the lower side of the container portion 110.

<5> A container piston 113 is installed in the container portion 110. When the quantity of the cosmetics in the containing space 111 is reduced as the cosmetics is discharged by the pumping device 200, the container piston 113 gradually moves upward by the minus pressure in the containing space 111. In such a situation, the outside air can flow into the container portion 110 through the aperture 115, so the upward movement of the container piston 113 is not hindered.

<6> The pumping device 200 is comprised of a nozzle cap 220 installed on the top of the container portion 110, a nozzle button 210 installed on the

nozzle cap 220, a cylinder 230 installed under the nozzle cap 220, an upper plunger 260 and a lower plunger 270 that pass through the nozzle cap 220, and a spring 240 and a ball 250 installed in the cylinder 230.

<7> The nozzle cap 220 is fixed on the top of the container portion 110 to provide a frame through which the entire pumping device 200 is installed on the container portion 110. A gasket 223 is disposed between the nozzle cap 220 and the container portion 110, which keeps the airtight state between the container portion 110 and the nozzle cap 220.

<8> The nozzle button 210 is assembled with the upper plunger 260 at the upper side of the nozzle cap 220, and a nozzle 213 is installed on the side of the nozzle button 210. The nozzle 213 provides the discharge port for discharging the cosmetic outside when a user presses the nozzle button 210.

<9> The upper part of the upper plunger 260 is assembled with the nozzle button 210, and the lower part of the upper plunger 260 is assembled with the upper part of the lower plunger 270. Therefore, the nozzle button 210, the upper plunger 260 and the lower plunger 270 move down together, when the user presses the nozzle button 210.

<10> The cylinder 230 is disposed in the container portion 110, and an inflow port 233 through which the cosmetics in the containing space 111 flows into the cylinder 230 is formed at the lower end thereof. The ball 250 is disposed in the cylinder 230 near the inflow port 233.

<11> The lower part of the lower plunger 270 is accommodated in the cylinder 230, and the spring 240 is disposed between the lower end of the lower plunger 270 and the ball 250. Accordingly, the lower plunger 270 is maintained to be pressed upward and the ball 250 is maintained to close the inflow port 233 of the cylinder 230 by the elastic force of the spring 240.

<12> Meanwhile, the nozzle button 210, the upper plunger 260 and the lower plunger 270 are formed with the passages 217, 267 and 277 respectively, which are connected consecutively. The passage 217 of the nozzle button 210 is connected to the nozzle 213, and the end of the passage 277 of the lower plunger 270 is located in the cylinder 230. In such a situation, the opening

at the end of the passage 277 of the lower plunger 270 is closed by the inner wall of the cylinder 230 while the lower plunger 270 is pressed upward by the elastic force of the spring 240 as shown in FIG. 1, and the opening at the end of the passage 277 of the lower plunger 270 is moved to the inner space of the cylinder 230 to be opened in the inner space of the cylinder 230 when the lower plunger 270 is moved downward.

<13> The pumping operation of the conventional liquid container having such a construction is as follows.

<14> As the user presses the nozzle button 210 downward with his own finger, the upper plunger 260 and the lower plunger 270 move downward together against the elastic force of the spring 240. In such a situation, the ball 250 closes the inflow port 233 strongly by the downward elastic force of the spring 240, and the passage 277 of the lower plunger 270 is opened in the cylinder 230. Accordingly, the cosmetics that has been filled up in the cylinder 230 is discharged outside through the nozzle 213 via the passage 277 of the lower plunger 270, the passage 267 of the upper plunger 260, and the passage 217 of the nozzle button 210.

<15> As the user releases the nozzle button 210, the lower plunger 270, the upper plunger 260 and the nozzle button 210 are moved upward together by the elastic force of the spring 240. In that situation, they are moving upward while the passage 277 of the lower plunger 270 is closed by the inner wall of the cylinder 230, so the inner space of the cylinder 230 becomes minus pressure status, and the ball 250 moves upward against the elastic force of the spring 240 by the lowering of the pressure in the cylinder 230. Therefore, the inflow port 233 of the cylinder 230 is opened, and then the cosmetics filled up in the containing space 111 flows into the cylinder 230 through the inflow port 233.

<16> Summarizing such a process, the cosmetics filled in cylinder 230 is discharged outside through the nozzle 213 as ball 250 closes the inflow port 233 when the user presses the nozzle button 210, and the cosmetics in the container portion 110 flows into the cylinder 230 as ball 250 opens the

inflow port 233 when the user releases the nozzle button 210.

<17> As such a process is repeated, the user can discharge and use a certain amount of cosmetics every time he presses the nozzle button 210. In such a situation, the container piston 113 moves upward by the lowering of the pressure in the containing space 111 as the quantity of the cosmetics in the container portion 110 is reduced by the discharge of the cosmetics, and therefore, the inflow port 233 of the cylinder 230 can keep contacting with the cosmetics.

<18> However, such a conventional liquid container has the following problems.

<19> That is, such a conventional liquid container consists of many small parts as shown in FIG. 1, so the construction is complex, and it is hard to manufacture, and therefore, the productivity is low and the manufacturing costs rise.

<20> Furthermore, since the cosmetics in the container portion 110 has to flow into the cylinder 230 in order to be discharged outside, the cosmetics keeps contacting with the spring 240 made of metallic material while the cosmetics is waiting in the cylinder 230. As much time passes while the cosmetics is in contact with the metal spring 240, the quality of cosmetics may deteriorate or the discharged cosmetics may contain rust as the metal spring 240 is rusted.

【Disclosure】

【Technical Problem】

<21> The present invention has been proposed to overcome the above-described problem, and it is the object of the present invention to provide a liquid container which is constituted with a small number of parts to reduce the manufacturing costs.

<22> In is another object of the present invention to provide the liquid container having no probability that the quality of the cosmetics is deteriorated by the metallic spring while a predetermined amount of cosmetics can be discharged by the pumping operation.

【Technical Solution】

<23> To achieve the above objects, the present invention provides a liquid container comprising: a container portion for containing liquid; a first valve installed on an opening of the container portion, the first valve for allowing outflow of the liquid in the container portion and preventing inflow of the liquid into the container portion; a pressing portion for forming a pressing space on an outer side of the first valve, the pressing portion being made of soft material; and a second valve installed on the pressing portion, the second valve for allowing outflow of the liquid in the pressing space and preventing inflow of the liquid into the pressing portion. Here, at least one of the first valve and the second valve has a protrusion protruding outward and formed with a slit. In such a situation, at least the protrusion is made of soft material so that the slit is opened and closed elastically.

<24> A nozzle is disposed between the pressing portion and the second valve, which communicates the pressing space and the second valve with each other.

<25> The second valve can be installed in such a manner that passes through the pressing portion.

<26> The second valve is preferably formed integrally with the pressing portion. In such a situation, the protrusion of the second valve can be disposed on an end in view of a longitudinal direction of the container portion. Further, the protrusion of the second valve can be extended outward at a certain length.

<27> Meanwhile, the pressing portion can be disposed on a side in view of a longitudinal direction of the container portion, and in such a situation, a plurality of pressing portion can be formed.

<28> The protrusion can be changed to a variety of shapes such as a hemisphere, a partially deformed hemisphere, and a cone.

<29> Meanwhile, a spring can be installed in the pressing space. The spring functions to restore the pressing portion by applying elastic force to the pressing portion when the pressing portion is deformed to be recessed.

<30> A piston can be installed in the container portion. The piston can move in the container portion, and forms a containing space for containing the liquid between the piston and the first valve.

<31> Moreover, a discharge pipe can be installed on the first valve and extended into the container portion. The discharge pipe functions to provide a discharge passage of the liquid in the container portion toward the first valve.

<32> According to the present invention, the liquid container is constituted by a small number of parts, so the manufacturing cost thereof is low, the manufacturing process becomes simple, and the breakdown of the product is rare.

<33> According to another aspect of the present invention, the liquid container according to the present invention comprises: a container portion for containing liquid; and a valve installed on an opening of the container portion, the valve for allowing outflow of the liquid in the container portion and preventing inflow of the liquid into the container portion. In such a situation, the valve has a protrusion protruding outward and formed with a slit, and at least the protrusion is made of soft material so that the slit is opened and closed elastically.

<34> The valve is preferably made of a single member.

<35> A cap can be installed on the opening of the container portion, which has a discharge passage for discharging the liquid in the container portion. In such a case, the valve is preferably installed on an end of the discharge passage of the cap. Furthermore, the valve is preferably fixed to the cap by being joined with an inner side of the discharge passage of the cap with a protrusion-recess engagement.

<36> As another example of the cap, the cap can be assembled with the container portion so as to fix the valve by pressing the valve onto the opening of the container portion.

<37> The container portion is preferably made of soft material so as to be deformed by an exterior force.

<38> According to the preferred embodiment of the present invention, a wrinkled portion is prepared on at least a part of the container portion.

<39> Meanwhile, according to still another preferred embodiment of the present invention, a means for opening/closing the opening of the container portion so as to allow and prevent discharge of the liquid in the container portion through the valve is prepared.

<40> The opening/closing means includes a opening/closing part prepared on an inner wall of the container portion at a position near the opening. The opening/closing part closes the opening partially. In such a situation, the valve is opened and closed by the opening/closing part with respect to a containing space of the container portion according to a moved position thereof. It is preferable that the valve is installed to be rotatable, and is opened and closed by the opening/closing part with respect to the containing space of the container portion according to a position in a rotational direction thereof. The opening/closing part is preferably formed integrally with the container portion.

<41> Meanwhile, the cap is installed to be rotatable with respect to the container portion, and it is preferable that the valve is assembled with the cap to be relatively fixed in the rotational direction so that the valve is rotated together with the cap when the cap is rotated.

<42> Meanwhile, according to the present invention, a valve made of a single member is provided, which comprises a protrusion that protrudes outward and is formed with a slit, wherein at least the protrusion is made of soft material so that the slit is opened and closed elastically.

<43> The valve according to the present invention has a rib assembled with another member by a hooking manner. The rib is formed integrally with the valve. Further, the plurality of slits are arranged radially on the protrusion.

<44> The valve according to the present invention can have a pressing portion formed integrally with the protrusion and made of soft material, which forms a pressing space on a side opposite to the protrusion.

【Best Mode】

<45> Hereinafter, the present invention will be described in greater detail with reference to the accompanying drawings.

<46> FIG. 2 is a side sectional view of a liquid container having a pumping device according to the first embodiment of the present invention, and FIG. 3 is an exploded perspective view of FIG. 2.

<47> The liquid container according to the present invention has the container portion 610 for containing the liquid such as cosmetics, and a pumping device 500 for discharging the liquid contained in the container portion 610.

<48> The container portion 610 has a shape of a cylinder, and an aperture 615 is formed on the lower side of the container portion 610. A container piston 613 is installed in the container portion 610. The container piston 613 can be moved upward and downward in the container portion 610, and divides the inner space of the container portion 610 in vertical direction. The upper space in the container portion 610, which is between the pumping device 500 and the container piston 613, more particularly between the first valve 510 and the container piston 613, forms the containing space 611 for containing the liquid.

<49> When the quantity of the cosmetics in the containing space 611 is reduced as the cosmetics is discharged by the pumping device 500, the container piston 613 gradually moves upward by the minus pressure in the containing space 611. In such a situation, the outside air can flow into the container portion 610 through the aperture 615, so the upward movement of the container piston 613 is not hindered.

<50> The pumping device 500 according to the present invention is comprised of a first valve 510, a second valve 520, a pressing member 530, a spring 540 and a nozzle 550. Such a pumping device 500 is fixed on the opening 610a of the container portion 610 airtightly by a fixing member 630. More particularly, the first valve 510 is loaded on the opening 610a of the container portion 610, the pressing member 530 is loaded on the first valve

510, the second valve 520 is installed on the side of the pressing member 530, and the fixing member 630 is assembled with the opening 610a of the container portion 610 by the screwed assembly or by force fitting, by which the pressing member 530 and the first valve 510 are fixed airtightly on the upper edge of the opening 610a.

<51> The first valve 510 has a shape of a disk, and has a protrusion 513 protruding outward at the central area thereof. The protrusion 513 is formed with slits 515. The slits 515 are formed to a cross shape. In such a situation, the entire part of the first valve 510 or at least the protrusion 513 in the first valve 510 is made of soft material. Then, the slits 515 can be opened and closed elastically.

<52> In such a structure, as the slits 515 are formed on the protrusion 513, the first valve 510 can allow the outflow of the liquid in the container portion 610 and prevent the inflow of the liquid into the container portion 610. In other words, referring to FIGS. 4 and 5, the slits 515 are opened as shown in FIG. 5 to allow the outflow of the liquid in the container portion 610 toward the outside of the first valve 510 when the pressure at the outside of the container portion 610 is lower than the pressure at the inside of the container portion 610, and the slits 515 are closed as shown in FIG. 4 to prevent the reflow of the liquid into the container portion 610 when the pressure at the outside of the container portion 610 is higher than or equal to the pressure at the inside of the container portion 610.

<53> The pressing member 530 is formed into a dome shape so as to form a pressing space P1 at the outer side of the first valve 510. The pressing member 530 is made of soft material so that it can be deformed to be recessed as the outside force is applied by such an operation that the user presses with his own finger or the like, and accordingly, the pressing space P1 is pressed. Further, when the user removes the outside force, the pressing member 530 is restored to the original state thereof by the elastic force of itself.

<54> The second valve 520 is disposed at the side of the pressing member

530, and basically has the construction similar to the first valve 510, i. e., the construction that has the protrusion 523 protruding outward and having the slits 525. A nozzle 550 through which the pressing space P1 is connected with the inner space P2 of the second valve 520 is disposed between the pressing member 530 and the second valve 520. Accordingly, the second valve 520 can discharge the liquid in the pressing space P1 toward the outside according to the same principle with the first valve 510, and functions to prevent the inflow of the liquid into the pressing space P1. In other words, the slits 525 of the second valve 520 are opened as shown in FIG. 5 to allow the outflow of the liquid in the pressing space P1 toward the outside through the nozzle 550, the inner space P2 and the slits 525 when the pressure in the pressing space P1 increases as the pressing member 530 is deformed by the outside force, and the slits 525 of the second valve 520 are closed as shown in FIG. 4 to prevent the inflow of the liquid or air from the outside when the pressure in the pressing space P1 is reduced as the pressed status of the pressing space P1 is removed.

<55> Meanwhile, the spring 540 is installed in the pressing space P1. The spring 540 functions to restore the pressing member 530 by applying the elastic force when the pressing member 530 is deformed to be recessed. The spring 540 can be made of metallic material, plastic, or the like. When the spring 540 is made of plastic, there is no problem due to the rust.

<56> The operation of the liquid container according to the present invention having the above construction is as follows.

<57> As the user presses the pressing member 530 with his finger or any other method, the pressing member 530 is deformed to be recessed and the pressure in the pressing space P1 increases. By the increases of pressure in the pressing space P1, the first valve 510 is closed as shown in FIG. 4 and the second valve 520 is opened as shown in FIG. 5. Therefore, the liquid that has been filled up in the pressing space P1 is discharged outside through the second valve 520.

<58> As the user releases the pressing member 530 from such a status, the

pressing member 530 is restored to the original state thereof by the elastic force of the spring 540 and the restoring force of the pressing member 530 itself, and therefore, the volume of the pressure space P1 increases to cause the lowering of the pressure in the pressing space P1. Then, the first valve 510 is opened as shown in FIG. 5 and the second valve 520 is closed as shown in FIG. 4. Therefore, the liquid that has been contained in the containing spaced 611 is drawn into the pressing space P1 to be filled up in the pressing space P1.

<59> As the liquid in the containing space 611 is drawn into the pressing space P1 as described above, the quantity of the liquid in the containing space 611 is reduced to cause the rise of the container piston 613. Therefore, the liquid in the containing space 611 is kept contacting with the first valve 510.

<60> According to the present invention having the above construction, the pumping device can be constructed easily with only a few simple members. Thus, the construction of the liquid container becomes very simple, and the manufacturing cost becomes low and productivity of assembly process increases. Furthermore, there is little probability of breakdown of the liquid container due to the simple construction. In particular, since the first valve 510 and the second valve 520 are respectively made of a single member, the structure of the valve is very simple and it can be manufactured easily.

<61> FIG. 6 is a side sectional view of a liquid container having a pumping device according to the second embodiment of the present invention, and FIG. 7 is an enlarged view of the second valve shown in FIG. 6.

<62> In the description of the following embodiments, the parts same with those in the first embodiment are not illustrated in detail and are referred to with the same reference numerals. In the present embodiment, the construction of the second valve 720 is different from that of the first embodiment.

<63> That is, the second valve 720 has the protrusion 723 and the slits 725

which is the same construction with the first embodiment, however, the second valve 720 is installed directly on the pressing member 530. The second valve 720 passes through the pressing member 530, and the inner space P2 thereof communicates with the pressing space P1. In such a status, a rib 727 which is hooked on the inner side of the pressing member 530 is formed to protrude sideward of the second valve 720 at the end of the second valve 720, in order to prevent the detachment of the second valve 720.

<64> The operation of the liquid container according to the present embodiment is the same with that of the first embodiment. However, the liquid in the containing space P1 is discharged outside not through the nozzle 550 as in the first embodiment but directly after the liquid flows into the inner space P2 of the second valve 520.

<65> FIGS. 8 through 10 show the modifications of the second valve shown in FIG. 7. The second valve 720 having the protrusion 723 of hemisphere shape as shown in FIG. 7 can be modified to the shapes as shown in FIGS. 8 through 10. In FIG. 8, the protrusion 723a of the second valve 720a has a shape of a cone. In FIG. 9, the protrusion 723b of the second valve 720b has a shape of a deformed hemisphere, In FIG. 10, the protrusion 723 of the second valve 720 is covered by a cap 729, and a discharge port 729a for discharging the liquid is formed on a part of the cap 729.

<66> As described above, the protrusion 723 can be formed to various shapes in order to change the discharge direction or in order to change the appearance to enhance the visual sense.

<67> FIGS. 11 and 12 show modifications of the slits 515 and 725 formed on the protrusions 513 and 723 of the first valve 510 or the second valve shown 720 in FIG. 6, which show the examples that a plurality of slits 515a, 725a, 515b and 725b are formed in a radial fashion. In FIG. 11, three slits 515a and 725a are arranged in a triangle shape, and in FIG. 12, four slits 515b and 725b are arranged in a radial fashion. The size, the number and the arrangement of the slits can be changed in a variety of manners to control the opening degree of the first valve 510 and the second valve 720.

<68> FIG. 13 is a side sectional view of a liquid container having a pumping device according to the third embodiment of the present invention.

<69> In the present embodiment, the difference from the above embodiments is that the second valve 820 is formed integrally with the pressing member 830. The second valve 820 has the protrusion 823 and the slits 825, which is the same with that of the above embodiments.

<70> Further, the present embodiment is different from the above embodiments in that the spring is not installed in the pressing space P1. Therefore, the restoration after the pressing member 830 is deformed is due to only the elastic force of the pressing member 830 itself.

<71> Further, the present embodiment is different from the above embodiments in that a discharge pipe 870 is installed in the container portion 610. The upper end of the discharge pipe 870 is connected to the first valve 860 through a pipe-shaped connecting member 860, and the lower part of the discharge pipe 870 is extended downward into the container portion 610. The discharge pipe 870 provides the passage that the liquid in the container portion 610 flows toward the first valve 860.

<72> According to the present embodiment, the number of parts is small and the construction is simple in comparison with the aforementioned embodiments since the second valve 820 and the pressing member 830 are formed integrally in a body.

<73> Furthermore, the number of parts is still smaller and the construction is still simpler since there is no spring. Moreover, there is an advantage that the deterioration of the quality of liquid due to the rust or the like generated on the metallic material does not occur since the liquid is not in contact with the spring generally made of metal while the liquid is waiting in the pressing space P1.

<74> In addition, according to the present embodiment, there is another advantage that the container piston is not needed in the container portion 610 since the liquid is drawn through the discharge pipe 870 during the pumping operation of the pumping device 500.

<75> FIGS. 14 through 16 show the modifications of the third embodiment shown in FIG. 13. These modifications are the same as the aforementioned third embodiment in that the second valve 820a, 820b or 820c is formed integrally with the pressing member 830a, 830b or 830c, and there is no spring, and are different from the aforementioned third embodiment in that the protrusion 823a, 823b or 823c is formed at the end in the longitudinal direction of the container portion 610, i. e., the upper end of the pumping device 500.

<76> In such a situation, as shown in FIGS. 14 and 15, the protrusion 823a or 823b can be extended upward at a certain length. Further, as shown in FIG. 14, the pressing member 830a can be arranged at the side in view of the longitudinal direction of the container portion 610, and in such a situation, as shown in FIG. 15, a plurality of pressing members 830b can be formed at the side.

<77> According to such modifications, if the liquid container is to be used for a specific purpose, for example, for dropping eyewater onto the eyes of a human, the liquid container can be manufactured to be convenient to the respective purposes.

<78> Meanwhile, in the description of the present embodiment, all of the first valve and the second valve have been equipped with the protrusion and the slits, however, it is possible that only one of the first valve and the second valve is manufactured as the valve having such a construction and the other is manufactured as a different type of valve member or valve device.

<79> Further, in the embodiments of the present invention, the pressing member has been constituted as a single member, however, the pressing member can be constituted by another type of mechanical device for the pressing operation. For example, if a device that can provide strong discharge force is to be manufactured according to the technical concept of the present invention, it is possible to manufacture such a device with strong discharge force by preparing additional pressing mechanism operated by the user.

<80> FIG. 17 is a side sectional view of a liquid container according to the

fourth embodiment of the present invention. In the present embodiment, the liquid container is comprised of a container portion 910, a cap 920 and a valve 930.

<81> The container portion 910 contains the liquid, and it is preferable that the liquid container 910 is made of soft material so that it can be deformed by exterior force. When the user presses the outer surface of the container portion 910, the pressure in the container portion 910 increases.

<82> A wrinkled portion 913 is formed on the upper part of the container portion 910. The wrinkled portion 913 enlarges or reduces the container portion 910 as being shortened or extended by the exterior force. When the user shortens the wrinkled portion 913, the pressure in the container portion 910 increases. The wrinkled portion 913 can be formed over all area of the container portion 910. Further, the container portion 910 having the wrinkled portion 913 can be manufactured by manufacturing the wrinkled portion 913 as a separate member and assembling it with the container portion 910 without the wrinkled portion 913.

<83> The cap 920 is installed on the upper opening of he container portion 910. The cap 920 is assembled airtightly with the container portion 910 by being screwed with the upper part of the container portion 910 as shown in FIG. 17. The cap 920 has a passage 925 that communicates with the inner space of the container portion 910. The liquid contained in the container portion 910 can be discharged outside through the passage 925.

<84> The valve 930 basically has the construction same with that of the second valve 920 shown in FIG. 6. That is, the valve 930 has the protrusion 933 that protrudes outward and is formed with the slits 935, and at least the protrusion 933 is made of soft material so that the slits 935 are opened and closed elastically. Furthermore, the valve 930 is made of a single member.

<85> The valve 930 is installed at the end of the passage 925 of the cap 920, and a protruding rib 939 is formed at the end of the valve 930, which is engaged with the inner side of the passage 925 by the protrusion-recess engagement. Accordingly, as the valve 930 made of soft material is inserted

into the passage 925 of the cap 920, the valve 930 can be fixed to the cap 920 easily. According to such a construction, the valve 930 can allow the discharge of the liquid in the container portion 910 and prevent the inflow of liquid into the container portion 910.

<86> As the user presses the container portion 910 or shorten the wrinkled portion 913 with his hand, the liquid in the container portion 910 is discharged outside through the passage 925 and the valve 930. The operation of the valve 930 in such a situation is the same as that of the second valve in the above embodiments. As the user releases the pressing force applied to the container portion 910 or the wrinkled portion 913, the discharge of the liquid is stopped and the valve 930 is closed.

<87> According to the present embodiment, it is possible to discharge liquid with very simple construction. According to such a construction, the container portion 910 is kept to a normally close state even without an additional lid on the container portion 910, so the additional operation such as to open the lid for discharging the liquid in the container portion 910 becomes needless. Therefore, that can be used conveniently as a container for containing contents such as toothpaste that is used frequently and is required to prevent the contact with air in ordinary times.

<88> FIGS. 18 and 19 are side sectional views of a liquid container according to the fifth embodiment of the present invention, and FIG. 20 is an upper side view of the valve shown in FIG. 18.

<89> In the present embodiment, an assembly rib 1013 is formed on the circumference of the container portion 1010 near the upper opening of the container portion 1010, and the cap 1020 has the inner shape corresponding to the assembly rib 1013, by which the cap 1020 is assembled with the upper part of the container portion 1010 by insertion. Accordingly, the cap 1020 is not detached from the container portion 1010, and simultaneously, is rotatable with respect to the container portion 1010.

<90> Meanwhile, the valve 1030 has the protrusion 1033 and slits 1035 as in the case of the above embodiments. In the present embodiment, the valve 1030

is formed with the rib 1038 at the circumference thereof, and a plurality of assembly protrusions 1039 are formed on the rib 1039 in the radial fashion. An opening/closing protrusion 1032 is formed on the inner side of the valve 1030, and the opening/closing protrusion 1032 partially closes the inflow passage into the valve 1030.

<91> The valve 1030 is loaded on the upper side of the container portion 1010, and in such a status, the cap 1020 is assembled with the container portion 1010. Then, the rib 1038 functions as a gasket as the rib 1038 of the valve 1030 is pressed by the cap 1020, and therefore, the valve 1030 is fixed on the container portion 1010, and the airtight close state of the container portion 1010 is maintained.

<92> In such a situation, the inner side of the cap 1020 has the shape corresponding to the assembly protrusion 1039 of the valve 1030, by which the cap 1020 and the valve 1030 is fixed relatively to each other in the rotational direction designated in FIGS. 18 and 19 and the valve 1030 is rotated together with the cap 1020 when the cap 1020 is rotated.

<93> An opening/closing portion 1015 having the shape of a plate is prepared on the inner wall at the position adjacent to the opening of the container portion 1010. The opening/closing portion 1015 partially closes the opening of the container portion 1010. The opening/closing portion 1015 can be attached to the inner wall of the container portion 1010 after being manufactured as a separate member, and can be manufactured integrally with the container portion 1010. In order that the opening/closing portion 1015 can be manufactured integrally with the container portion 1010, as shown in FIGS. 18 and 19, it is preferable that the container portion 1010 is manufactured as two members, the upper member 1011 and the lower member 1012, and then two members are assembled with each other by adhesive or the like.

<94> According to such a construction, the liquid in the container portion 1010 can be discharged through the valve 1030 by applying the exterior force as in the case of the fourth embodiment, and simultaneously, it is possible to prevent undesired discharge of the liquid by a simple operation while the

container is not used.

<95> That is, if the user does not want to discharge the liquid, the user can make the state as shown in FIG. 18 by rotating the cap 1020 with his hand so that the valve 1030 is rotated together with the cap 1020. Then, the part that is not closed by the opening/closing portion 1015 is closed by the opening/closing protrusion 1032 of the valve 1030. Therefore, the opening of the container portion 1010 is perfectly closed and the valve 1030 is closed with respect to the containing space of the container portion 1010, whereby the discharge of the liquid is prevented.

<96> Meanwhile, if the user wants to discharge the liquid, the user can make the state as shown in FIG. 19 by rotating the cap 1020 with his hand so that the valve 1030 is rotated together with the cap 1020. Then, the opening/closing protrusion 1032 is moved to the opening/closing portion 1015 to open the opening of the container portion 1010. Therefore, the user can discharge the liquid in the container portion 1010 through the valve 1030 by pressing the container portion 1010.

<97> FIG. 21 shows the modification of the valve shown in FIG. 20.

<98> The valve 1030a shown in FIG. 21 has the protrusion 1033 and the slits 1035 as in the case of the valve 1030 shown in FIG. 20, however, the construction of the rib 1038a is different from that of the valve 1030 shown in FIG. 20. That is, the rib 1038a has the shape of a disk of which a part is cut away, by which the rib 1038a is assembled to be fixed relatively to the cap 1020 in the rotational direction. According to such a construction, the construction that the valve 1030a is rotated together with the cap 1020 when the cap 1020 is rotated can be implemented more easily.

<99> Meanwhile, further modifications as mentioned in the description of the first embodiment and the third embodiment can be applied to the above-mentioned fourth embodiment and the fifth embodiment.

<100> For example, the liquid containers of the fourth and fifth embodiments can be manufactured as the construction that the valve is installed at the end of the nozzle, the number, the shape and the position of the slits can be

modified in a variety of manners, and the shape of the protrusion can be changed variously.

【Industrial Applicability】

<101> As described above, according to the present invention, the liquid container is constituted by a small number of parts, so the manufacturing cost thereof is low, the manufacturing process becomes simple, and the breakdown of the product is rare. Furthermore, the liquid container according to the invention provides great convenience while it is used.

<102> The preferred embodiments have been illustrated and described so far, however, it will be understood by those skilled in the art that various changes and modifications can be made within the spirit and the scope of the present invention, and accordingly, the scope of the present invention is not limited within the described range but the following claims and the equivalents thereof.

【Description of Drawings】

<103> FIG. 1 is a side sectional view of an example of a conventional liquid container having a pumping device;

<104> FIG. 2 is a side sectional view of a liquid container having a pumping device according to the first embodiment of the present invention;

<105> FIG. 3 is an exploded perspective view of FIG. 2;

<106> FIGS. 4 and 5 respectively show the opened state and the closed state of the first valve or the second valve shown in FIG. 3;

<107> FIG. 6 is a side sectional view of a liquid container having a pumping device according to the second embodiment of the present invention;

<108> FIG. 7 is an enlarged view of the second valve shown in FIG. 6;

<109> FIGS. 8 through 10 show the modifications of the second valve shown in FIG. 7;

<110> FIGS. 11 and 12 show modifications of the slits formed on the first valve or the second valve shown in FIG. 6;

<111> FIG. 13 is a side sectional view of a liquid container having a pumping device according to the third embodiment of the present invention;

<112> FIGS. 14 through 16 show the modifications of the third embodiment shown in FIG. 13;

<113> FIG. 17 is a side sectional view of a liquid container according to the fourth embodiment of the present invention;

<114> FIGS. 18 and 19 are side sectional views of a liquid container according to the fifth embodiment of the present invention;

<115> FIG. 20 is an upper side view of the valve shown in FIG. 18; and

<116> FIG. 21 shows the modification of the valve shown in FIG. 20.

【CLAIMS】

【Claim 1】

<118> A liquid container comprising:

<119> a container portion for containing liquid;

<120> a first valve installed on an opening of the container portion, the first valve for allowing outflow of the liquid in the container portion and preventing inflow of the liquid into the container portion;

<121> a pressing portion for forming a pressing space on an outer side of the first valve, the pressing portion being made of soft material; and

<122> a second valve installed on the pressing portion, the second valve for allowing outflow of the liquid in the pressing space and preventing inflow of the liquid into the pressing portion,

<123> wherein at least one of the first valve and the second valve has a protrusion protruding outward and formed with a slit, and at least the protrusion is made of soft material so that the slit is opened and closed elastically.

【Claim 2】

<124> The liquid container of claim 1, further comprising a nozzle disposed between the pressing portion and the second valve, the nozzle for communicating the pressing space and the second valve with each other.

【Claim 3】

<125> The liquid container of claim 1, wherein the second valve is installed in such a manner that passes through the pressing portion.

【Claim 4】

<126> The liquid container of claim 1, wherein the second valve is formed integrally with the pressing portion.

【Claim 5】

<127> The liquid container of claim 4, wherein the protrusion of the second valve is disposed on an end in view of a longitudinal direction of the container portion.

【Claim 6】

<128> The liquid container of claim 4, wherein the protrusion of the second valve is extended outward at a certain length.

【Claim 7】

<129> The liquid container of claim 4, wherein the pressing portion is disposed on a side in view of a longitudinal direction of the container portion.

【Claim 8】

<130> The liquid container of claim 7, wherein a plurality of said pressing portion are formed.

【Claim 9】

<131> The liquid container of claim 1, wherein the protrusion has a shape of one of a hemisphere, a partially deformed hemisphere, and a cone.

【Claim 10】

<132> The liquid container of claim 1, wherein a plurality of said slits are formed on the protrusion in a radial fashion.

【Claim 11】

<133> The liquid container of claim 1, further comprising a cap for covering the protrusion of the second valve, the cap being formed with a discharge port on a part thereof.

【Claim 12】

<134> The liquid container of claim 1, further comprising a spring installed in the pressing space, the spring for restoring the pressing portion by applying elastic force to the pressing portion when the pressing portion is deformed to be recessed.

【Claim 13】

<135> The liquid container of claim 1, further comprising a piston installed in the container portion so as to be movable in the container portion, the piston for forming a containing space for containing the liquid between the piston and the first valve.

【Claim 14】

<136> The liquid container of claim 1, further comprising a discharge pipe

installed on the first valve and extended into the container portion, the discharge pipe for providing a discharge passage of the liquid in the container portion toward the first valve.

【Claim 15】

<137> The liquid container of claim 1, wherein at least one of the first valve and the second valve is made of a single member.

【Claim 16】

<138> A liquid container comprising:

<139> a container portion for containing liquid; and

<140> a valve installed on an opening of the container portion, the valve for allowing outflow of the liquid in the container portion and preventing inflow of the liquid into the container portion,

<141> wherein the valve has a protrusion protruding outward and formed with a slit, and at least the protrusion is made of soft material so that the slit is opened and closed elastically.

【Claim 17】

<142> The liquid container of claim 16, wherein the valve is made of a single member.

【Claim 18】

<143> The liquid container of claim 16, further comprising a cap installed on the opening of the container portion, the cap having a discharge passage for discharging the liquid in the container portion, wherein the valve is installed on an end of the discharge passage of the cap.

【Claim 19】

<144> The liquid container of claim 18, wherein the valve is fixed to the cap by being joined with an inner side of the discharge passage of the cap with a protrusion-recess engagement.

【Claim 20】

<145> The liquid container of claim 16, further comprising a cap installed on the opening of the container portion, the cap being assembled with the container portion so as to fix the valve by pressing the valve onto the

opening of the container portion.

【Claim 21】

<146> The liquid container of claim 16, wherein the container portion is made of soft material so as to be deformed by an exterior force.

【Claim 22】

<147> The liquid container of claim 16, further comprising a wrinkled portion prepared on at least a part of the container portion.

【Claim 23】

<148> The liquid container of claim 16, further comprising a means for opening/closing the opening of the container portion so as to allow and prevent discharge of the liquid in the container portion through the valve.

【Claim 24】

<149> The liquid container of claim 23, wherein the opening/closing means includes a opening/closing part prepared on an inner wall of the container portion at a position near the opening, and the valve is opened and closed by the opening/closing part with respect to a containing space of the container portion according to a moved position thereof.

【Claim 25】

<150> The liquid container of claim 24, wherein the valve is installed to be rotatable, and is opened and closed by the opening/closing part with respect to the containing space of the container portion according to a position in a rotational direction thereof.

【Claim 26】

<151> The liquid container of claim 25, further comprising a cap installed on the opening of the container portion, the cap being assembled with the container portion so as to fix the valve by pressing the valve onto the opening of the container portion.

【Claim 27】

<152> The liquid container of claim 26, wherein the cap is installed to be rotatable with respect to the container portion, and the valve is assembled with the cap to be relatively fixed in the rotational direction so that the

valve is rotated together with the cap when the cap is rotated.

【Claim 28】

<153> The liquid container of claim 24, wherein the opening/closing part is formed integrally with the container portion.

【Claim 29】

<154> The liquid container of claim 16, wherein a plurality of said slits are formed on the protrusion in a radial fashion.

【Claim 30】

<155> A valve made of a single member, the valve comprising a protrusion that protrudes outward and is formed with a slit, wherein at least the protrusion is made of soft material so that the slit is opened and closed elastically.

【Claim 31】

<156> The valve of claim 30, wherein a rib is formed integrally on an outer side thereof, the rib for being assembled with another member by a hooking manner.

【Claim 32】

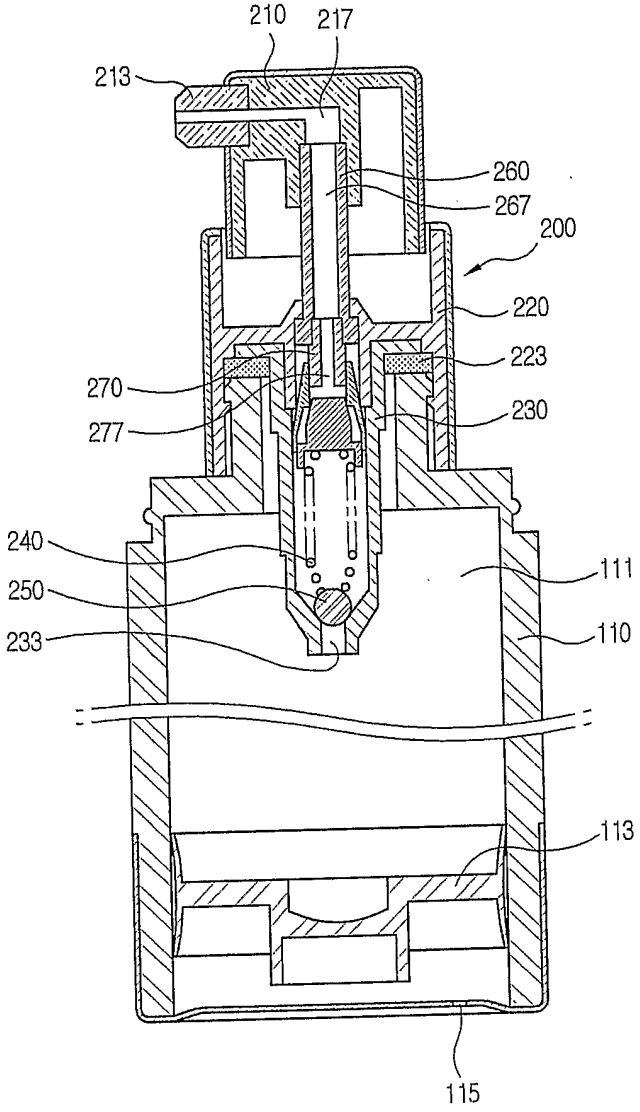
<157> The valve of claim 30, wherein a plurality of said slits are formed on the protrusion in a radial fashion.

【Claim 33】

<158> The valve of claim 30, further comprising a pressing portion formed integrally with the protrusion and made of soft material, the pressing portion for forming a pressing space on a side opposite to the protrusion.

【DRAWINGS】

【Figure 1】



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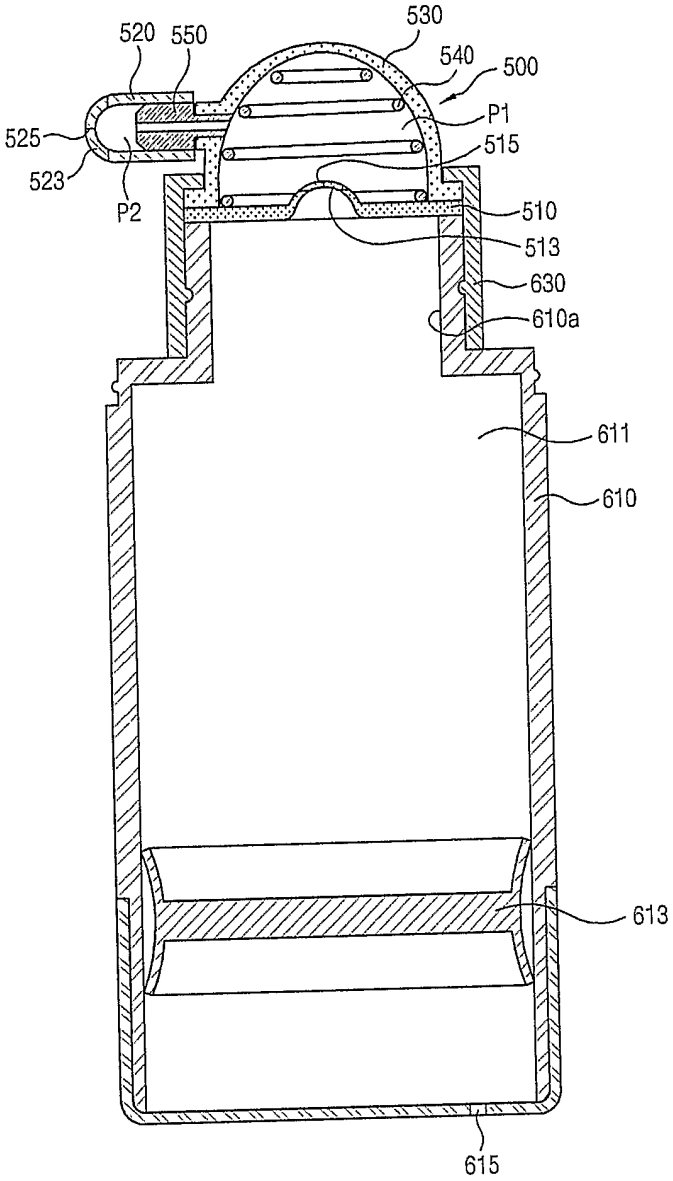
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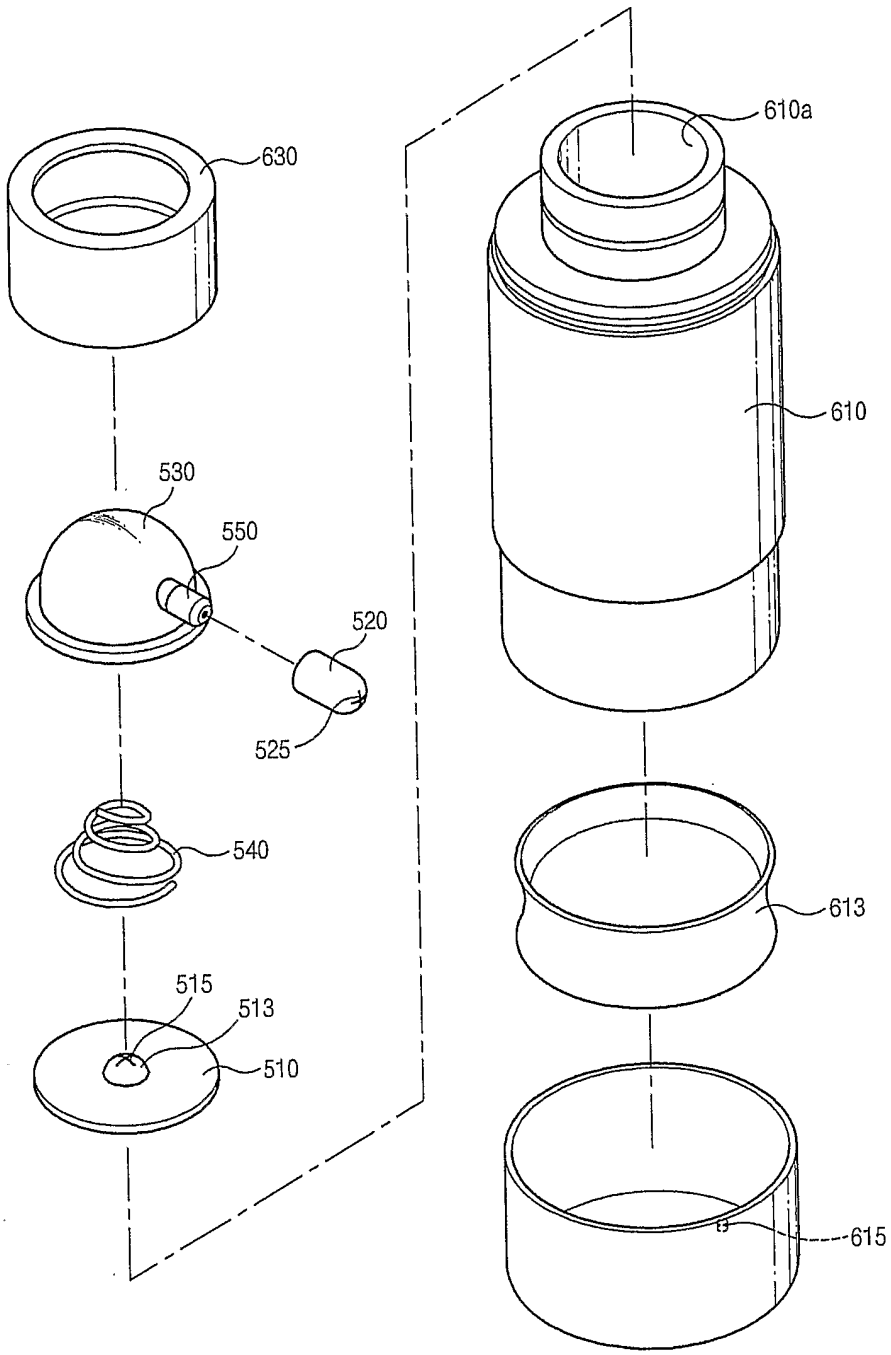

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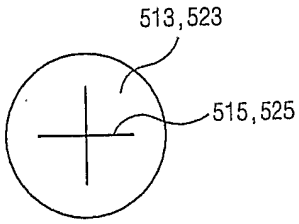

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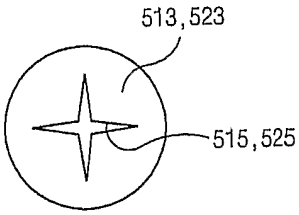

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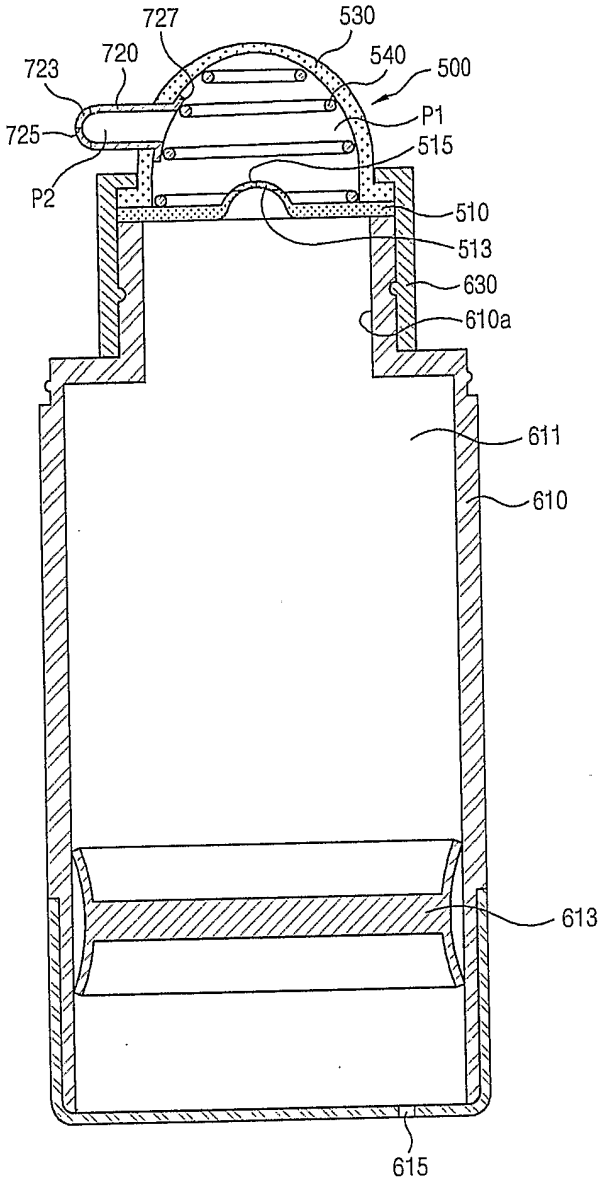

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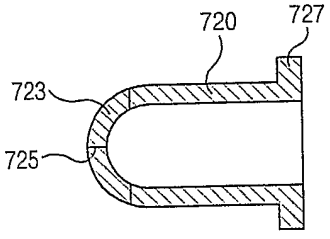

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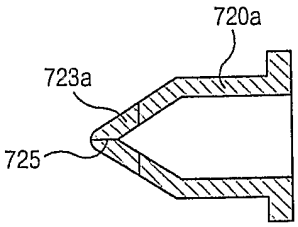

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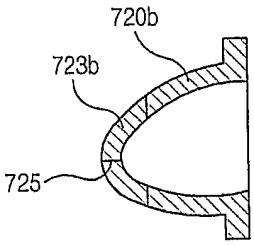

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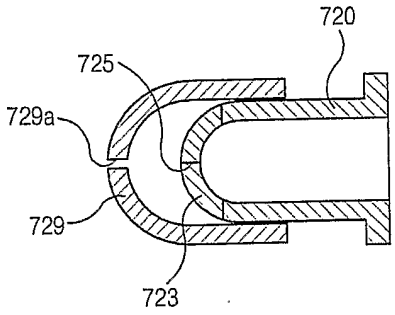

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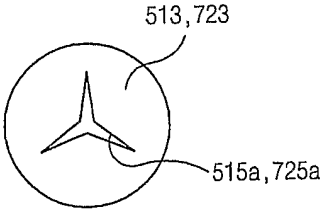

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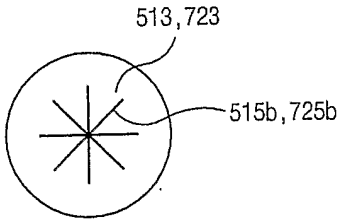

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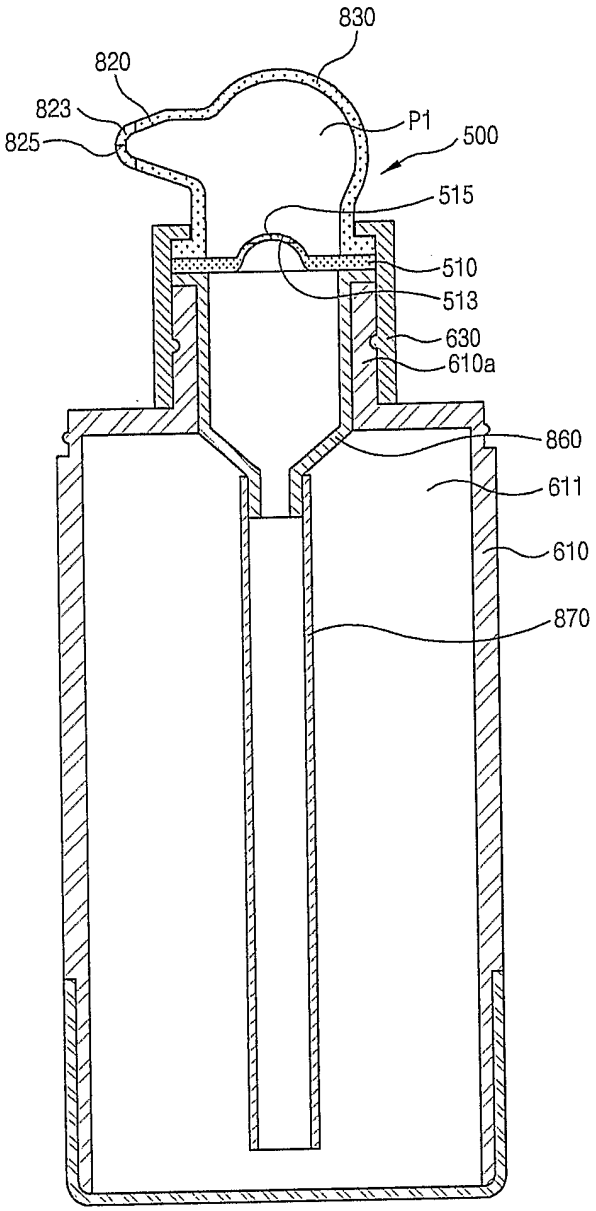

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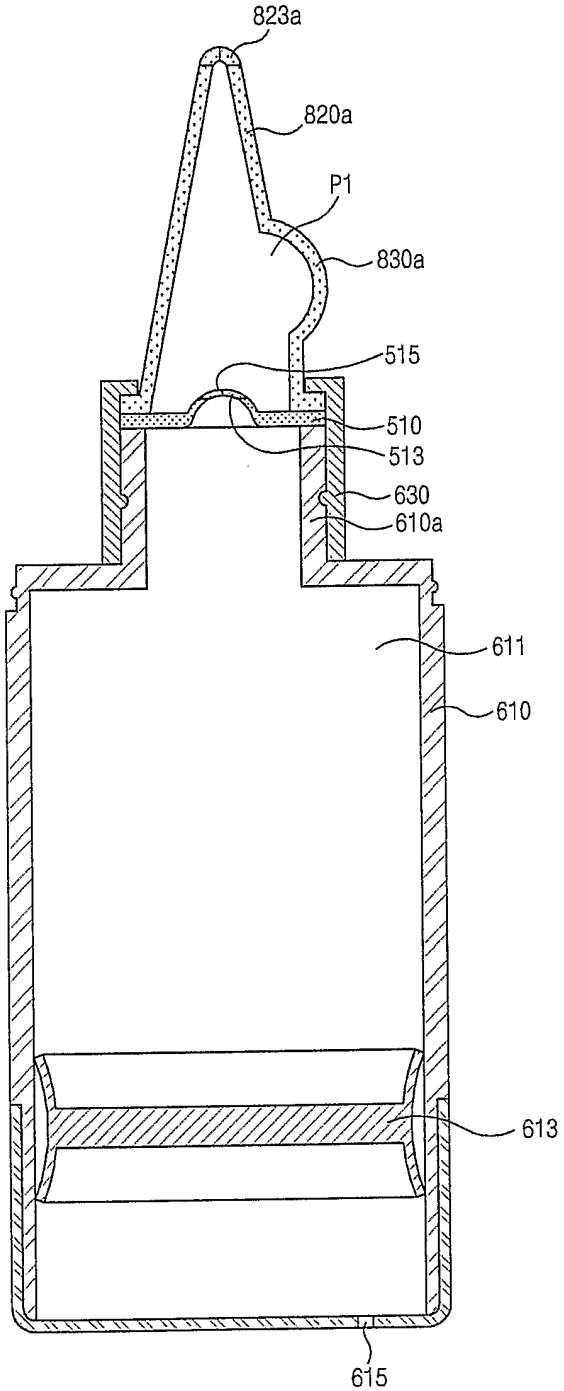

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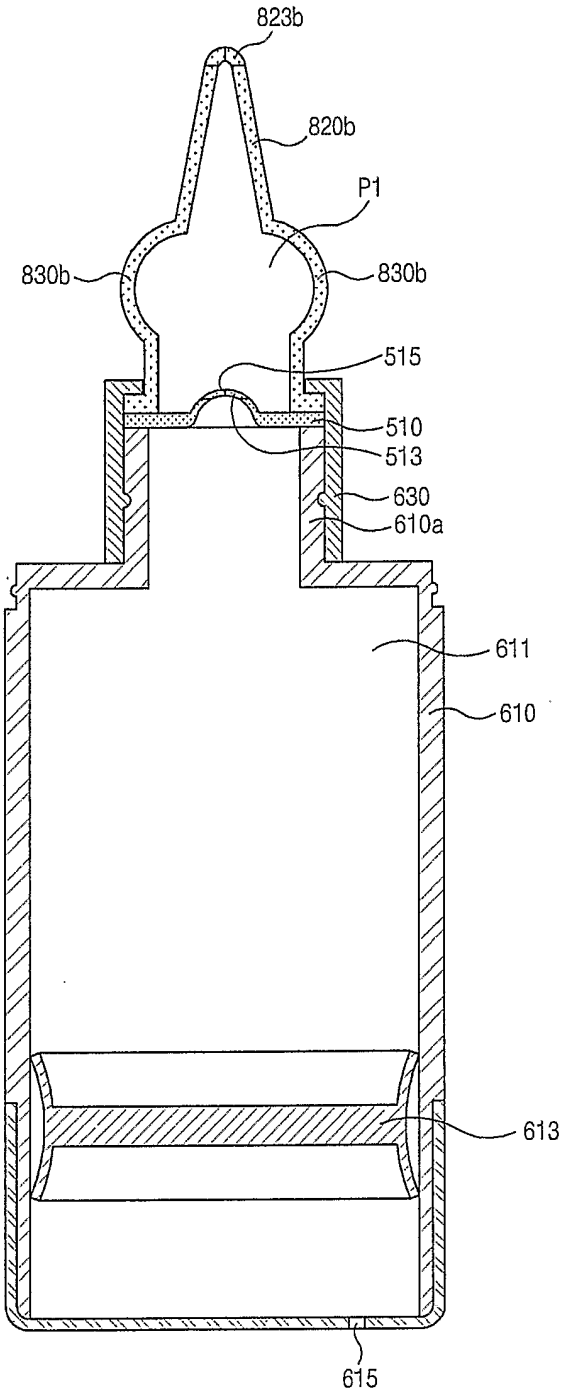

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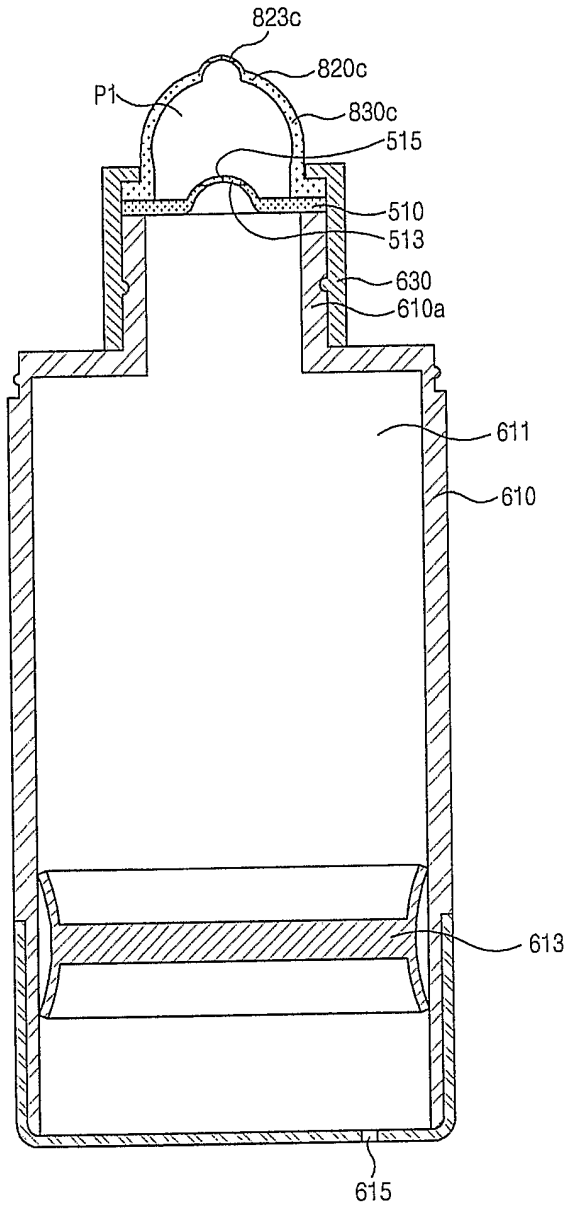

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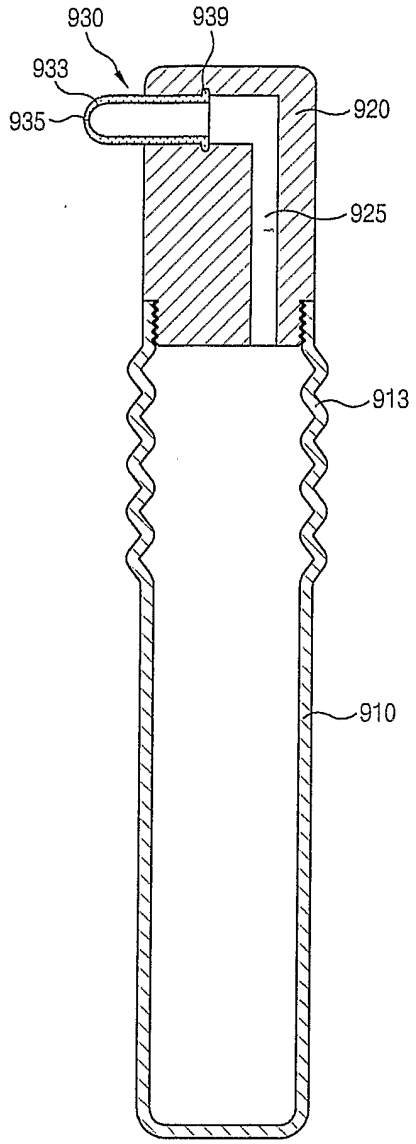

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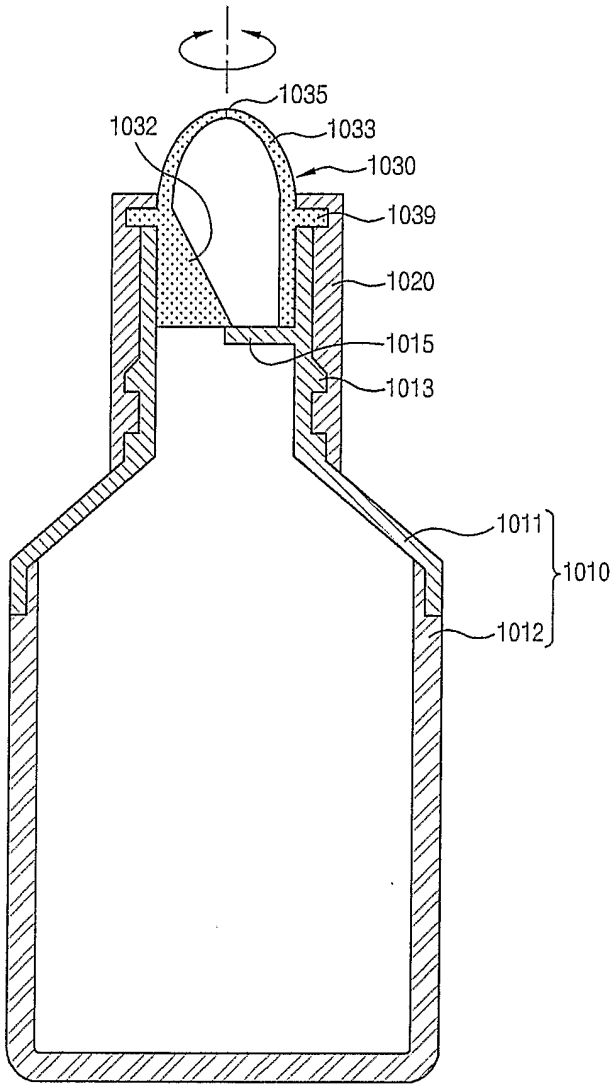

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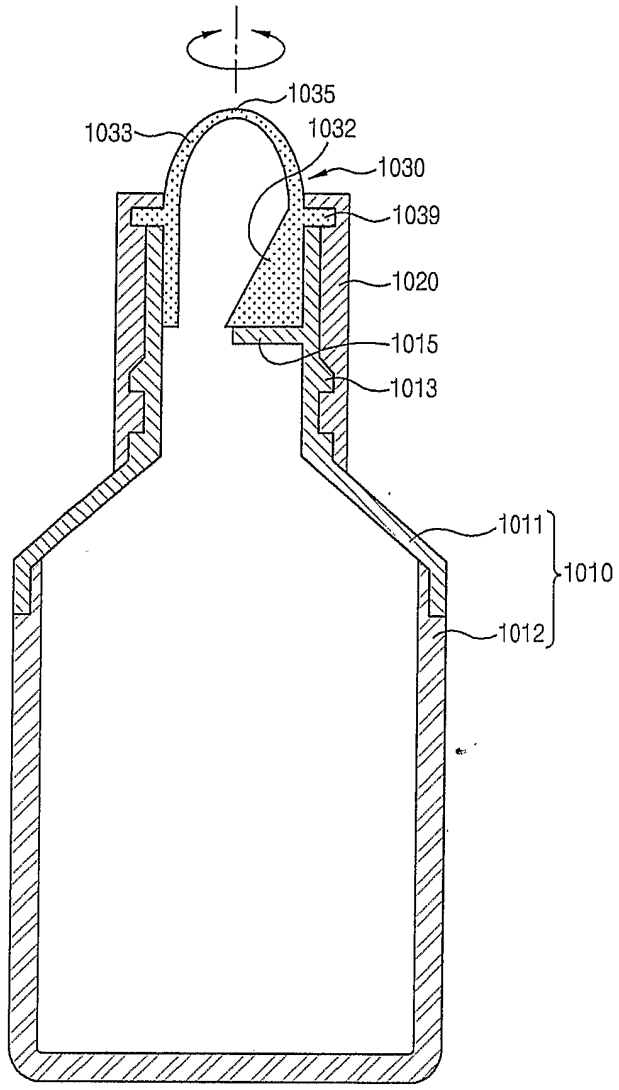
【Figure 19】



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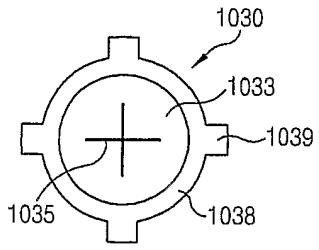

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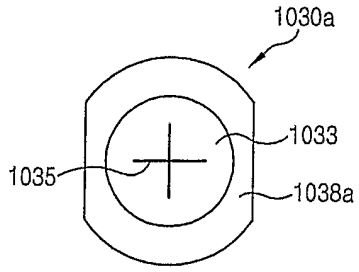
【Figure 21】



<182>

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2005/002694

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 B65D 47/34

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 35/50; B65D 47

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

Korean Patents and applications for inventions since 1975
Korean Utility models and applictions for Utility models since 1975
Japanese Utility models and application for Utility models since 1975

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

KIPO eKIPASS system

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 52-057038 U (TOSEIYOKI K.K.) 25 April 1977 See the abstract; Figs. 2, 3	16, 17, 21 - 23 20, 29
X	JP 60-089143 U (OTA, SUSUMU) 19 June 1985 See the abstract; Fig. 2	16, 18, 19
X Y	JP 52-125537 U (KOISHIWARA, YASUO) 24 September 19770 See the abstract; Fig. 2	16 20
X	EP 0405472 A (PITTWAY CORP.) 2 January 1991 See the abstract; Fig. 1	16, 23
X Y	JP 53-051845 U (KURETAKE, KOUGYO K.K.) 02 May 1978 See the abstract; Figs.1, 2	30 - 32 29

☐ 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 application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of 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
02 DECEMBER 2005 (02.12.2005)	**09 DECEMBER 2005 (09.12.2005)**

Name and mailing address of the ISA/KR

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CHOI, Ki Hyuk

Telephone No. 82-42-481-5894

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR2005/002694

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JP60089143U	19.06.1985	NONE	
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