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(54) FOAM-JETTING TUBE CONTAINER

(57) A foam-jetting tube container is configured in that, when a container body is pressurized in a state of the container body being turned upside down, contents and air stored inside the container body flow into a first mixing part and are mixed so as to firstly form foam, and then are secondarily formed into foam through a foam mesh while passing through a second mixing part which communicates with the first mixing part, and then discharged to the outside, such that the foam can be jetted by means of a simple structure.

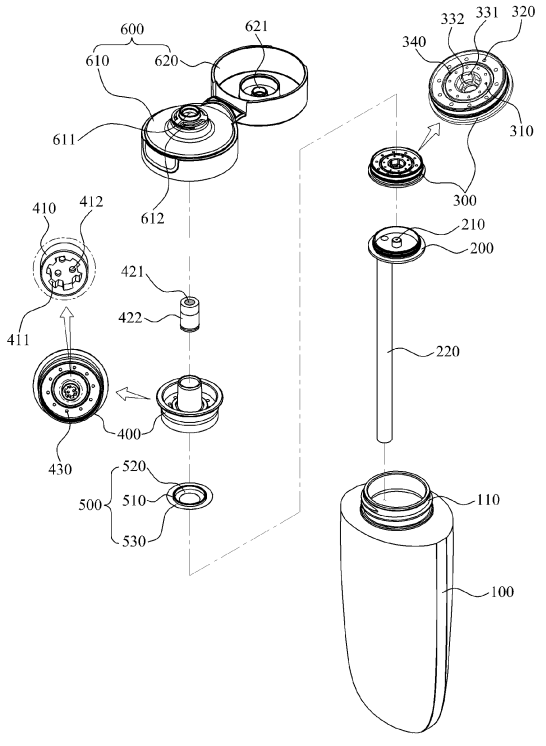

Fig. 1

EP 3 357 827 A1

Description

TECHNOLOGICAL FIELD

[0001] The present invention relates to a foam-jetting tube container configured in that, when a container body is pressurized in a state of the container body being turned upside down, contents and air stored inside the container body flow into a first mixing part and are mixed so as to firstly form foam, and then are secondarily formed into foam through a foam mesh while passing through a second mixing part which communicates with the first mixing part, and then discharged to the outside, such that the foam can be jetted by means of a simple structure.

BACKGROUND

[0002] Generally, a foam-jetting tube container refers to a container having a structure wherein a user pressurizes a container body with contents stored and makes the container form foam in the process of discharging the contents by mixing with outside air.

[0003] A foam-jetting tube container as described in the above is disclosed in the Korean Registered Patent No. 10-1067748 (hereafter called as 'the registered patent').

[0004] The registered patent, which the present applicant filed on October 09, 2009 and was registered as such, comprises a first container body containing contents; an inner container combined to an upper portion of the first container body and comprising a first tube neck to which a hollow is formed so as for the contents to be discharged; an outer container, which is combined to the inner container as encasing, comprising a second tube neck combined at an upper portion thereof, separated from the inner container with a constant distance and forming a space, which forms a multitude of first air holes separated with a constant distance; an inner cap which is combined to an upper portion of the outer container, comprising a multitude of second air holes separated with constant distance at an upper end thereof; a support cap which is combined to the inner cap at a lower portion of the second tube neck, comprising a protrusion wherein a multitude of third air holes are formed with a constant distance separated at a side thereof; a check valve combined to a lower portion of the support cap directly above the hollow and preventing reflux of content; an air valve which is combined, encasing a lower end of the second air holes and an inner circumferential surface of the support cap in an interior of the inner cap and, made of elastic material, opens/closes either the second air hole or a third air hole according to movement of air; and an outer cap which is combined, encasing the inner cap, comprising a foam mesh at an end of the center thereof.

[0005] However, the registered patent has some problems in that the container should be equipped with double tubes in order to make a space where air flows in to be kept, such that the manufacturing time and cost increase due to the complicated air inflowing structure to be equipped, thereby incurring burden to users.

SUMMARY OF THE DISCLOSURE

[0006] The present disclosure is directed to solving the problems in the above, and the objectives of the disclosed embodiments are to provide a foam-jetting tube container in that, when a container body is pressurized in a state of the container body being turned upside down, contents and air stored inside the container body flow into a first mixing part and are mixed so as to firstly form foam, and then are secondarily formed into foam through a foam mesh while passing through a second mixing part which communicates with the first mixing part, and then discharged to the outside, such that the foam can be jetted by means of a simple structure.

[0007] To solve the above problems, a foam-jetting tube container according to the disclosed embodiments includes: a container body storing contents and having a discharge hole formed at the upper portion thereof, deformed by user's pressurization, and discharging contents through the discharge hole; a contents movement part disposed at the inner side of the discharge hole and coupled with an air movement tube which functions as an air movement passage at the lower portion thereof, and provided with a contents outflow hole such that contents stored in the container body at the center portion thereof can flow out; an air movement part, coupled to the upper portion of the contents movement part, provided with an air outflow hole such that air remaining in the container body can flow out to the outside through the air movement tube, and further, provided with a first air movement hole such that the outside air can flow into the inside of the container body; a housing coupled to the discharge hole, and comprising a first mixing part forming a space where contents and air stored in the container body are mixed and then firstly formed to foam, and provided with a second mixing part which is connected with the first mixing part and forms a space where foam is secondarily formed; a valve member coupled to the upper portion of the air movement part and controlling the air movement according to the pressurization of the container body; and a finish cap encasing the housing and coupled to the discharge hole, and provided with a foam-jetting hole where the foam which is formed while passing through the first mixing part and the second mixing part can be jetted through.

[0008] Furthermore, it is characterized in that an air inflow hole is provided at the finish cap such that the outside air can flow in, and a second air movement hole is provided at the housing such that the air flowing into through the air inflow hole can move to the first air movement hole.

[0009] Furthermore, it is characterized in that the valve member includes a support body of a cylindrical shape coupled to the upper portion of the air movement part, a first wing extending and encasing the inner circumferen-

tial surface of the support body and opening/closing the air outflow hole, and a second wing extending

[0010] Furthermore, it is characterized in that the first wing is separated from the air outflow hole and opens the air outflow hole by the air pressure moving through the air movement tube when the container body is pressurized in a state of the container body being upside down, and the second wing is separated from the second air movement hole and opens the second air movement hole by the air pressure flowing in through the air inflow hole when the container body is depressurized.

[0011] Furthermore, it is characterized in that a plurality of air movement grooves are longitudinally provided at the inner circumferential surface of the air movement part such that the air flowing out through the air outflow hole moves into the interior of the first mixing part.

[0012] Furthermore, it is characterized in that at the inner side of the first mixing part is provided a communication groove which is connected with the air movement groove and guides the air moving through the air movement groove to move to the first mixing part.

[0013] Furthermore, it is characterized in that at the upper end of the first mixing part is provided a plurality of communication grooves which connect the first mixing part and the second mixing part.

[0014] As described as the above, the presently described embodiments are configured in that, when a container body is pressurized in a state of the container body being turned upside down, contents and air stored inside the container body flow into a first mixing part and are mixed so as to firstly form foam, and then are secondarily formed into foam through a foam mesh while passing through a second mixing part which communicates with the first mixing part, and then discharged to the outside, such that the foam can be jetted by means of a simple structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig.1 is an exploded perspective view illustrating a configuration of a foam-jetting tube container according to an exemplary embodiment.

Fig. 2 is an assembled perspective view illustrating a configuration of a foam-jetting tube container according to an exemplary embodiment.

Fig.3 is a cross-sectional view illustrating a configurations of a foam-jetting tube container according to an exemplary embodiment.

Figs. 4 and Fig. 5 are views illustrating an operational state of a foam-jetting tube container according to an exemplary embodiment.

DETAILED DESCRIPTION

[0016] Hereinafter, exemplary embodiments will be described in detail with reference to the accompanying drawings. The same reference numerals provided in the drawings indicate the same members.

[0017] Fig.1 is an exploded perspective view illustrating a configuration of a foam-jetting tube container according to an exemplary embodiment. Fig. 2 is an assembled perspective view illustrating a configuration of a foam-jetting tube container according to an exemplary embodiment. Fig.3 is a cross-sectional view illustrating a configurations of a foam-jetting tube container according to an exemplary embodiment.

[0018] Referring to Figs.1 to 3, a foam-jetting tube container according to an exemplary embodiment includes a container body 100, a contents movement part 200, an air movement part 300, a housing 400, a valve member 500, and a finish cap 600.

[0019] The container body 100, storing liquid-type contents, is provided with a discharge hole 110 at the upper portion thereof such that the contents can be discharged through.

[0020] The container body 100 can be composed of a tube container or a blow container which can be deformed by user's pressurization and discharge the stored contents by the inner pressure change,

[0021] The contents movement part 200, coupled to the lower portion of an air movement part 300 at the inner side of the discharge hole 110 and functioning as a passage where stored contents and air can move through, is provided with a contents outflow hole 210 at the center portion thereof such that the contents stored in the container body 100 can flow out, and is coupled, at one side of the lower end, with an air movement tube 220 which guides the air stored in the container body 100 to move to the air movement part 300.

[0022] The air movement part 300, coupled to the upper portion of the contents movement part 200 and forms a passage where air moves, is provided with a plurality of air outflow hole 310 separated with a predetermined distance apart such that the air remaining in the container body 100 can flow out to the outside through the air movement tube 220, and is formed with at least more than one first air movement hole 320 such that the outside air can move into the interior of the container body 100.

[0023] Meanwhile, at the center portion of the air movement part 300 is provided a coupling part 330 which is coupled to the first mixing part 410 of the housing 400, wherein at the inner circumferential surface of the coupling part 330 are provided a plurality of coupling protrusions 331 which are coupled with the first mixing part 410 and thereby, form a plurality of air movement grooves 332, such that the air flowing out through the air outflow hole 310 can pass through the air movement grooves 332 and move into the interior of the first mixing part 410.

[0024] Furthermore, at the upper end of the air movement part 300 is provided a valve coupling groove 340 which is disposed between the air outflow hole 310 and the first air movement hole 320 and supports a valve member 500 to be described.

[0025] The housing 400 is coupled to the discharge

hole 110 and closes the upper end of the discharge hole 110 at the upper portion of the container body 100. In the presently described embodiments, at the center portion of the housing 400 is provided a first mixing part 410 which forms a space such that the contents and air stored in the container body 100 are mixed and firstly generate foam, and furthermore, is provided a second mixing part 420 which is connected with the first mixing part 410 to form a space for secondly generating foam and is equipped with a foam mesh 421 at the inner side thereof.

[0026] At the inner side of the first mixing part 410 is provided a communication groove 411 which is connected with the air movement groove 332 and guides the air flowing through the air movement groove 332 to move to the first mixing part 410, and at the upper end thereof is provided a plurality of communication holes 412 which connect the first mixing part 410 and the second mixing part 420. After the contents and air stored in the container body 100 pass through the communication hole 412 and are firstly generated into foam in a process of moving up to the upper portion, the foam firstly generated passes through the communication hole 412 and goes through a foam mesh 421 installed at the inner side of the second mixing part 420 and then, are secondly generated into foam.

[0027] The foam mesh 421 can be composed of various structures for generating enough foam, and, as illustrated in Fig. 3, can be respectively provided at the upper end and the lower end of a fixation body 422 for fixing the foam mesh 421 at the inner side of the mixing part 420.

[0028] Meanwhile, at the housing 400 is provided a plurality of second air movement holes 430 which are separated with a predetermined distance apart such that the air flowing into through an air inflow hole 612 of the finish cap 600 can move to the first air movement hole 320.

[0029] The valve 500, coupled to the upper portion of the air movement part 300 and controlling the air movement according to pressurization of the container body 100, is composed of a support body 510 of a cylinder shape which is coupled to a valve coupling groove 340 formed at the upper end of the air movement part 300; a first wing 520 which extends as encasing the inner circumferential surface and opens/closes the air outflow hole 310; and a second wing 530 which extends as encasing the outer circumferential surface of the support body 510 and opens/closes the second air movement hole 430. The first wing 520 is configured to be disposed as closing the air outflow hole 310 at a normal state, and then to be separated from the air outflow hole 310 and to open the air outflow hole 310 by the pressure of the air flowing into through the air movement tube 220 when pressurizing the container body 100 in a state of the container body 100 being upside down. Meanwhile, the second wing 530 is configured to be disposed as closing the air outflow hole 310 at a normal state, and then to be separated from the air outflow hole 310 by the pressure of the air flowing into through the air inflow hole 612 of the finish cap 600 when pressurizing the container body 100 in a state of the container body 100 being upside down and to open the second air movement hole 430.

[0030] The finish cap 600, encasing the housing 400 and coupled to the discharge hole 110, includes a cap body 610 and a cover 620.

[0031] The cap body 610 has a screw thread formed at the inner circumferential surface thereof for being screw-coupled to the discharge hole 110, wherein a foam-jetting hole 611 is formed at the center portion of the upper end thereof such that the foam generated through the first mixing part 410 and the second fixing part 420 can be jetted.

[0032] Meanwhile, at the upper end of the cap body 610 is formed more than one air inflow holes 612 which surround the foam-jetting hole 611. The outside air flowing into through the air inflow hole 612 passes through a first air movement hole 320, and then moves into the interior of the container body 100 through the air movement tube 220.

[0033] The cover 620, which is hinge-coupled to one side of the cap body 610 and opens/closes the foam-jetting hole 611, is preferably provided, at the inner side thereof, with a closing protrusion 621 which closes the foam-jetting hole 611 and thereby prevents the contents from being leaked.

[0034] Hereafter, with a reference of Figs. 4 and Fig. 5, a foam-jetting process of a foam-jetting tube container according to exemplary embodiments will be described. Figs. 4 and Fig. 5 are views illustrating an operational state of a foam-jetting tube container according to an exemplary embodiment.

[0035] First, referring to Fig. 3, a foam-jetting tube container according to an exemplary embodiment, when a user pressurizes a container body 100 while holding the container body 100 in an upside-down position, the contents stored in the container body 100 flow into the first mixing part 410 through the contents outflow hole 210, and the air existing in the container body 100 simultaneously flows into the first mixing part 410 through the air movement tube 220. Due to this, the contents and air are mixed in the first mixing part 410 and are firstly generated into foam.

[0036] The air moving through the air movement tube 220 passes through the air outflow hole 310 and further passes through the air movement groove 332 and the communication groove 411, and then flows into the first mixing part 410. The first wing 520 is disposed as closing the air outflow hole 310 at a normal state, and then, is separated from the air outflow hole 310 and opens the air outflow hole 310 to make the air existing in the container body 100 move to the first mixing part 410 by the pressure of the air moving through the air movement tube 220 when the container body 100 is pressurized in a state of being upside down.

[0037] Next, the foam firstly generated in the interior of the first mixing part 410 moves to the second mixing

part 420 through the communication hole 412. At this time, foam is secondly generated as passing through the foam mesh 421 provided at the inner side of the second mixing part 420, and then is jetted to the outside through the foam-jetting hole 611.

[0038] As in the above, if the container body 100 is depressurized in a state of foam-jetting being completed, the inner pressure of the container body 100 is released as illustrated in Fig. 5, and the second wing 520 is separated from the second air movement hole 430 by the pressure of air flowing into through the air inflow hole 612 and then opens the second air movement hole 430. Therefore, the air flowing into through the air inflow hole 612 passes through the second air movement hole 430, passing through the first air movement hole 320, and moves to the air movement tube 220, such that the air can be stored in the interior of the container body 100.

[0039] The present invention is composed of an air inflowing structure such that air can flow into without being contacted with contents in a process of flowing into the container body 100. Therefore, it is possible to fundamentally solve the problem wherein air is generated in the interior of the container body 100 by the contact with contents in a process of the air flowing into through an traditional ball valve or a check valve.

[0040] As described above, optimal embodiments have been disclosed in the drawings and the specification. Although specific terms have been used herein, these are only intended to describe certain embodiments and are not intended to limit the meanings of the terms or to restrict the scope of the accompanying claims. Therefore, those skilled in the art will appreciate that various modifications and other equivalent embodiments are possible from the above embodiments. Therefore, the scope of the claims should be defined by the technical spirit of the description above.

Claims

1. a foam-jetting tube container, comprising:

a container body (100) storing contents and having a discharge hole (110) formed at the upper portion thereof, deformed by user's pressurization, and discharging contents through the discharge hole (110);

a contents movement part (200) disposed at the inner side of the discharge hole (110) and coupled with an air movement tube (220) functioning as an air movement passage at the lower portion thereof, and provided with a contents outflow hole (210) such that contents stored in the container body (100) at the center portion thereof can flow out;

an air movement part (300), coupled to the upper portion of the contents movement part (200), provided with an air outflow hole (310) such that air remaining in the container body (100) can flow out to the outside through the air movement tube (220), and further provided with a first air movement hole (320) such that the outside air can flow into the inside of the container body (100);

a housing (400) coupled to the discharge hole (110), and comprising a first mixing part (410) forming a space where contents and air stored in the container body (100) are mixed and then firstly formed to foam, and a second mixing part (420) which is connected with the first mixing part (410) and forms a space where foam is secondarily formed;

a valve member (500) coupled to the upper portion of the air movement part (300) and controlling the air movement according to the pressurization of the container body (100); and

a finish cap (600) encasing the housing (400) and coupled to the discharge hole (110), and provided with a foam-jetting hole (611) where the foam formed while passing through the first mixing part (410) and the second mixing part (420) can be jetted through.

2. The foam-jetting tube container of claim 1, **characterized in that** an air inflow hole (612) is provided at the finish cap (600) such that the outside air can flow in, and a second air movement hole (430) is provided at the housing (400) such that the air flowing into through the air inflow hole (612) can move to the first air movement hole (320).

3. The foam-jetting tube container of claim 2, **characterized in that** the valve member (500) includes a support body (510) of a cylindrical shape coupled to the upper portion of the air movement part (300), a first wing (520) extending and encasing the inner circumferential surface of the support body (510) and opening/closing the air outflow hole (310), and a second wing (530) extending as encasing the outer circumferential surface of the support body (510) and opening/closing the second air movement hole (430).

4. The foam-jetting tube container of claim 3, **characterized in that** the first wing (520) is separated from the air outflow hole (310) and opens the air outflow hole (310) by the air pressure moving through the air movement tube (220) when the container body (100) is pressurized in a state of the container body (100) being upside down, and the second wing (530) is separated from the second air movement hole (430) and opens the second air movement hole (430) by the air pressure flowing in through the air inflow hole (612) when the container body (100) is depressurized.

5. The foam-jetting tube container of claim 1, **characterized in that** a plurality of air movement grooves (332) are longitudinally provided at the inner circumferential surface of the air movement part (300) such that the air flowing out through the air outflow hole (310) moves into the interior of the first mixing part (410).

6. The foam-jetting tube container of claim 5, **characterized in that** at the inner side of the first mixing part (410) is provided a communication groove (411) which is connected with the air movement groove (332) and guides the air moving through the air movement groove (332) to move to the first mixing part (410).

7. The foam-jetting tube container of claim 6, **characterized in that** at the upper end of the first mixing part (410) is provided a plurality of communication grooves (411) which connect the first mixing part (410) and the second mixing part (420).

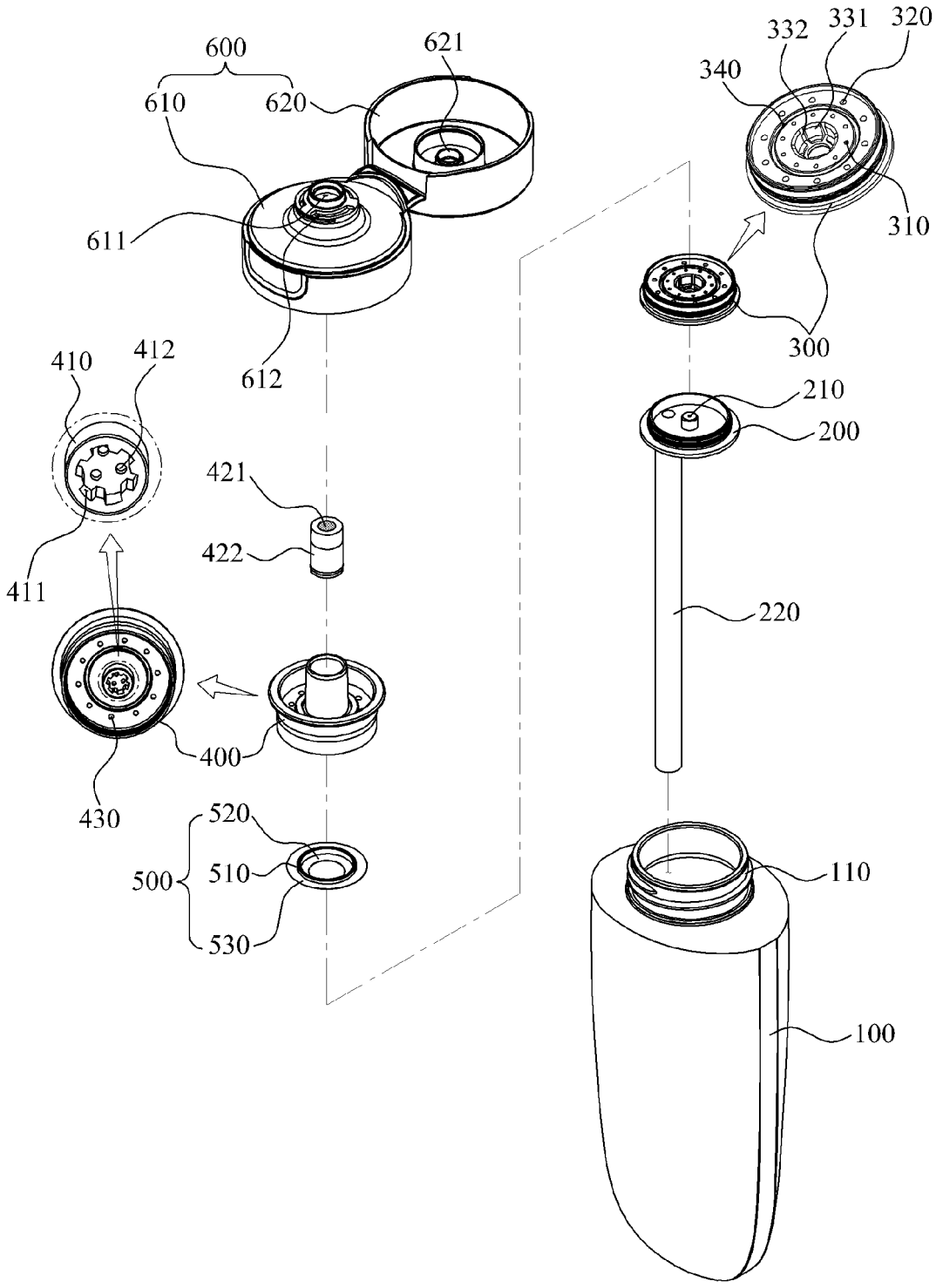
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Fig. 1

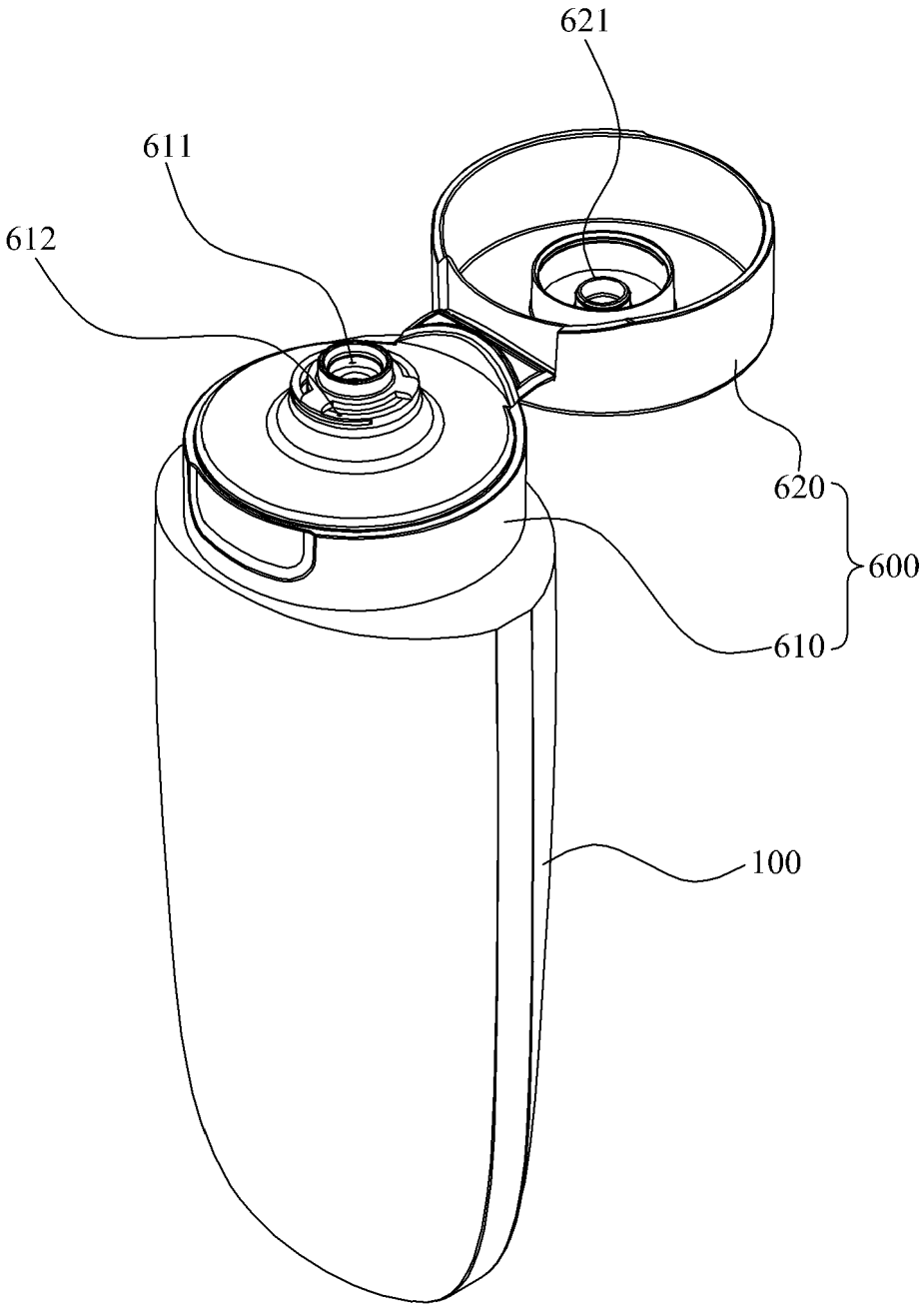

Fig. 2

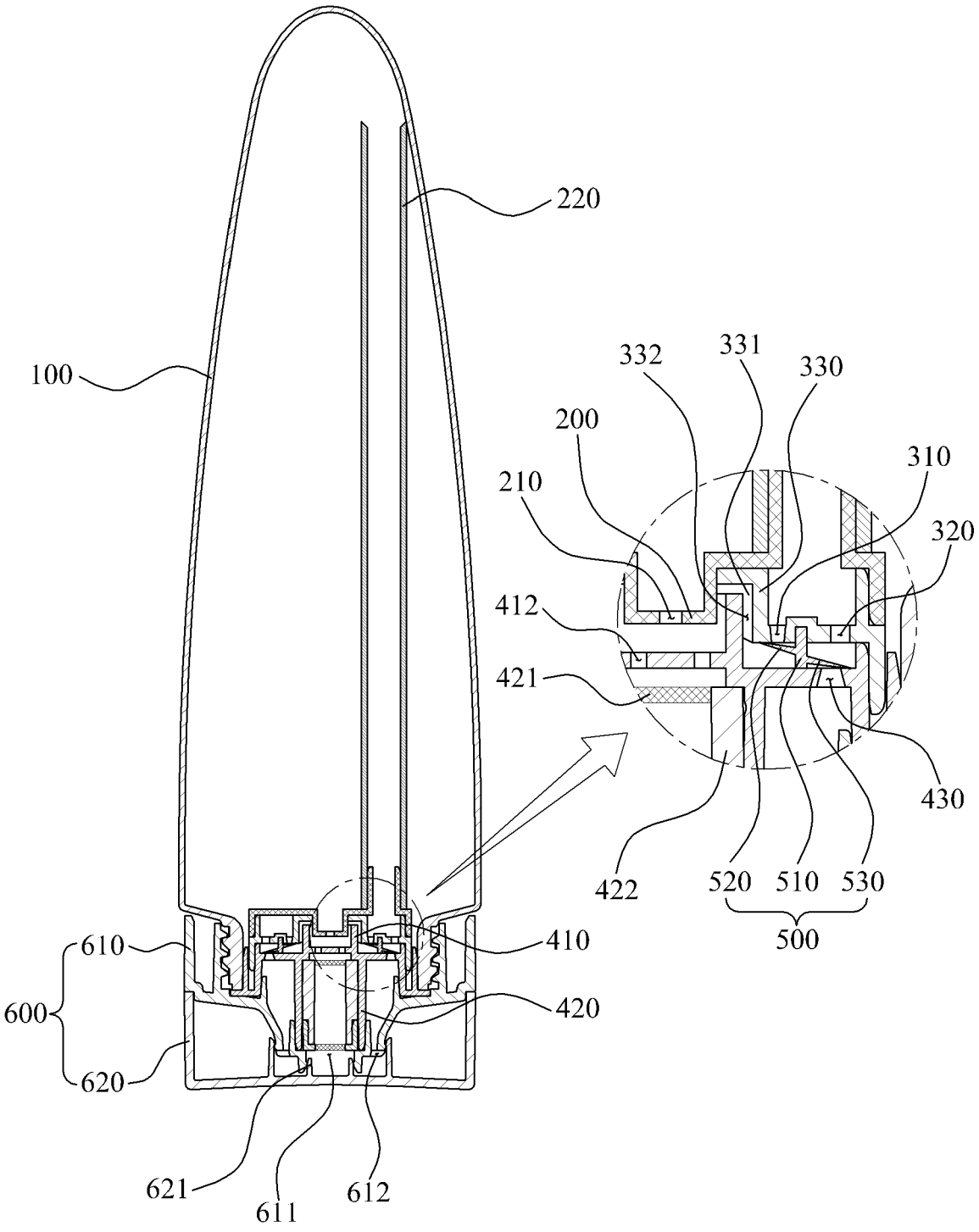
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Fig. 3

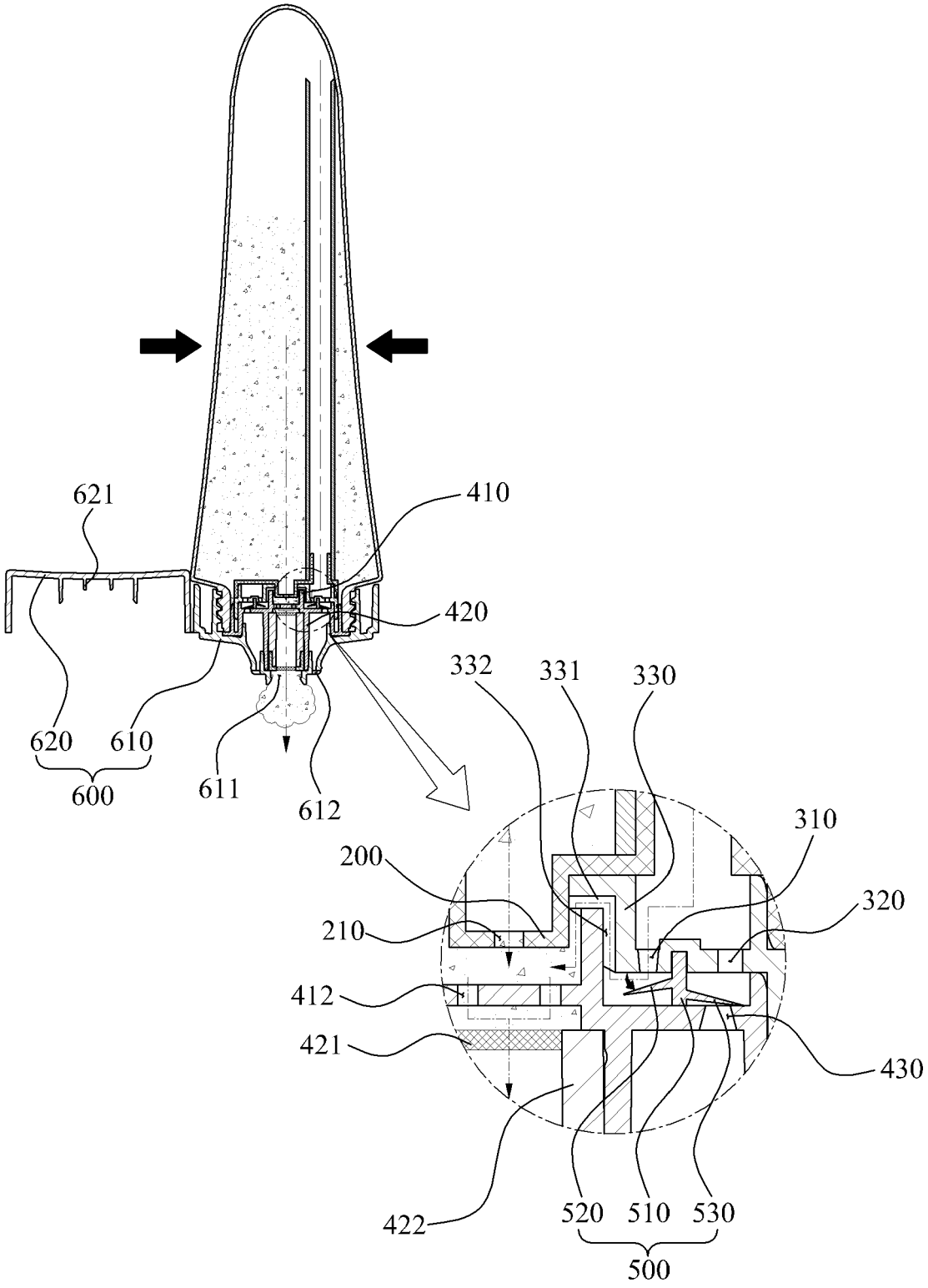
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Fig. 4

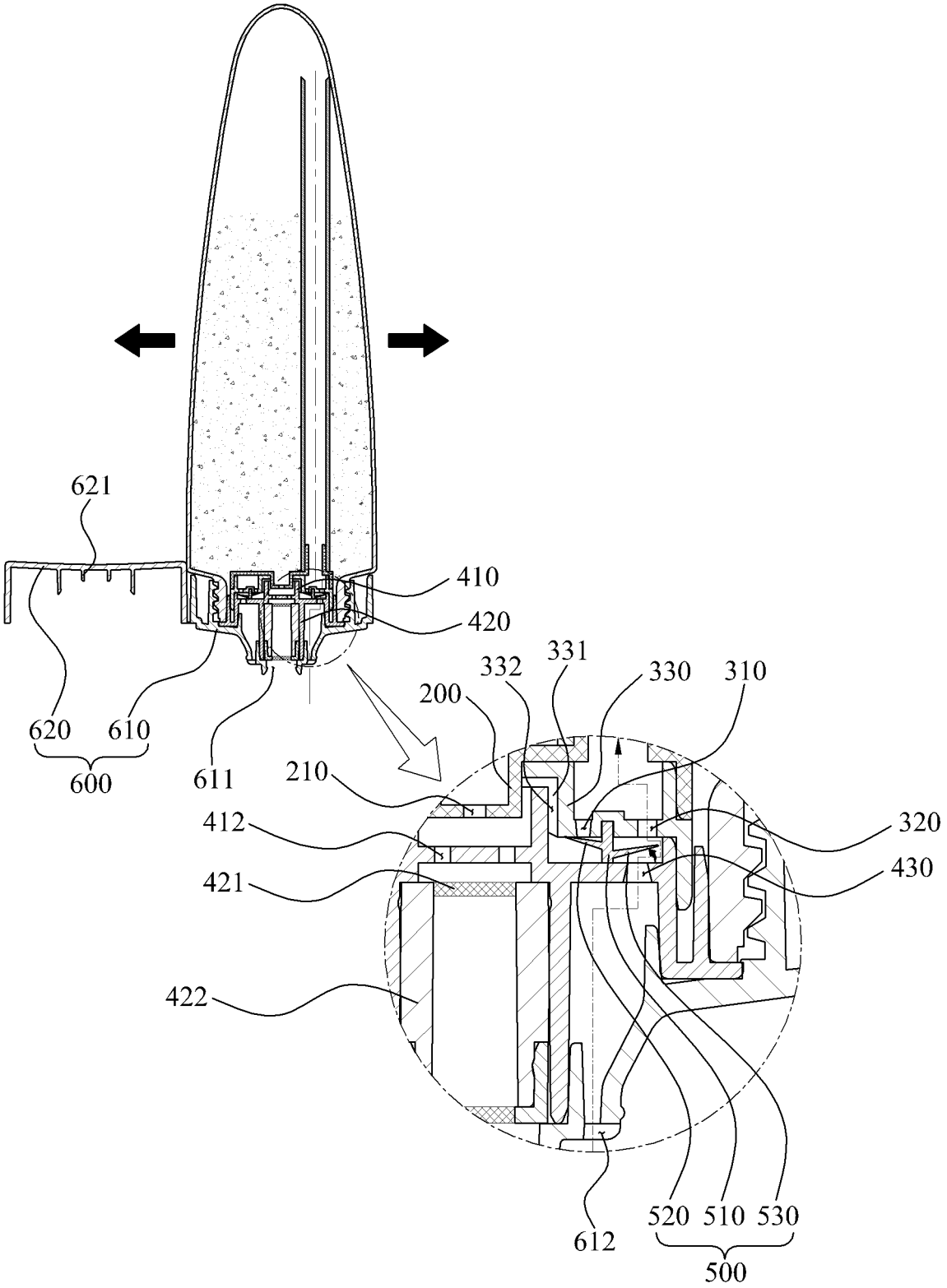
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Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2016/007459

A. CLASSIFICATION OF SUBJECT MATTER

B65D 35/44(2006.01)i, B65D 47/32(2006.01)i, B65D 85/73(2006.01)i

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 35/44; B65D 47/20; B05B 11/04; B65D 35/38; B65D 47/06; B65D 47/34; B65D 47/32; B65D 85/73

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: bubble, spout, valve, air, inflow, pressure, tube, container

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-1517825 B1 (APOLLO INDUSTRIAL CO., LTD.) 06 May 2015 See paragraphs [0020]-[0028], [0032]-[0034]; and figures 2-3, 7, 12-13.	1-7
Y	JP 11-105907 A (KAO CORP.) 20 April 1999 See paragraph [0018]; and figure 1.	1-7
A	KR 10-2015-0076136 A (YONWOO CO., LTD.) 06 July 2015 See paragraphs [0022]-[0057]; and figures 1-9.	1-7
A	WO 2013-151320 A1 (LEE, Gwon Haeng) 10 October 2013 See paragraphs [0028]-[0068]; and figures 1-16.	1-7
A	JP 2014-046938 A (YOSHINO KOGYOSHO CO., LTD.) 17 March 2014 See paragraphs [0014]-[0022]; and figures 1-2.	1-7

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

☒ See patent family annex.

* Special categories of cited documents:

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 NOVEMBER 2016 (07.11.2016)	**07 NOVEMBER 2016 (07.11.2016)**

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2016/007459

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Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- KR 101067748 **[0003]**