(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 150 508 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
05.04.2017 Bulletin 2017/14

(21) Application number: **15798771.0**

(22) Date of filing: **30.03.2015**

(51) Int Cl.:
B65D 47/34 *(2006.01)* ***B05B 11/00*** *(2006.01)*

(86) International application number:
PCT/JP2015/001828

(87) International publication number:
WO 2015/182028 (03.12.2015 Gazette 2015/48)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(30) Priority: **30.05.2014 JP 2014113546**

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(54) **PUMP STOPPER**

(57) Provided is a pump stopper (E, F) including a substantially cylindrical-shaped stopper main body (35) provided with a side opening (38) in a manner such that the stopper main body (35) is C-shaped in an upper view thereof. The stopper main body (35) includes, on one of an upper end side and a lower end side thereof, a regulating portion (41) that prevents a tubular body (28) of a nozzle head (D) from being displaced downward, and, on another one of the upper end side and the lower end side thereof, a space portion (42) that allows the tubular body (28) of the nozzle head (D) to be displaced downward when the pump stopper (E, F) is inserted between a top wall (5) of an attachment cap (B) and the tubular body (28) of the nozzle head (D).

FIG. 1A

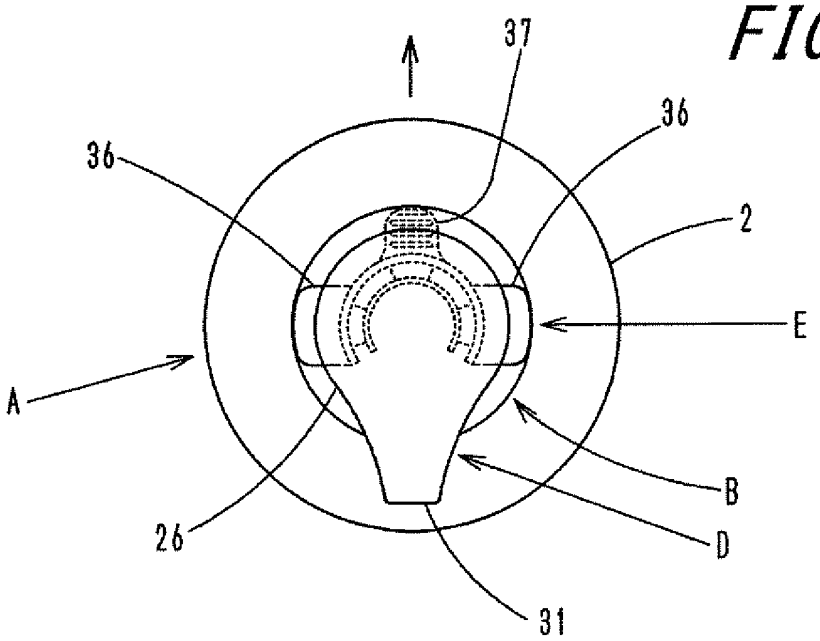

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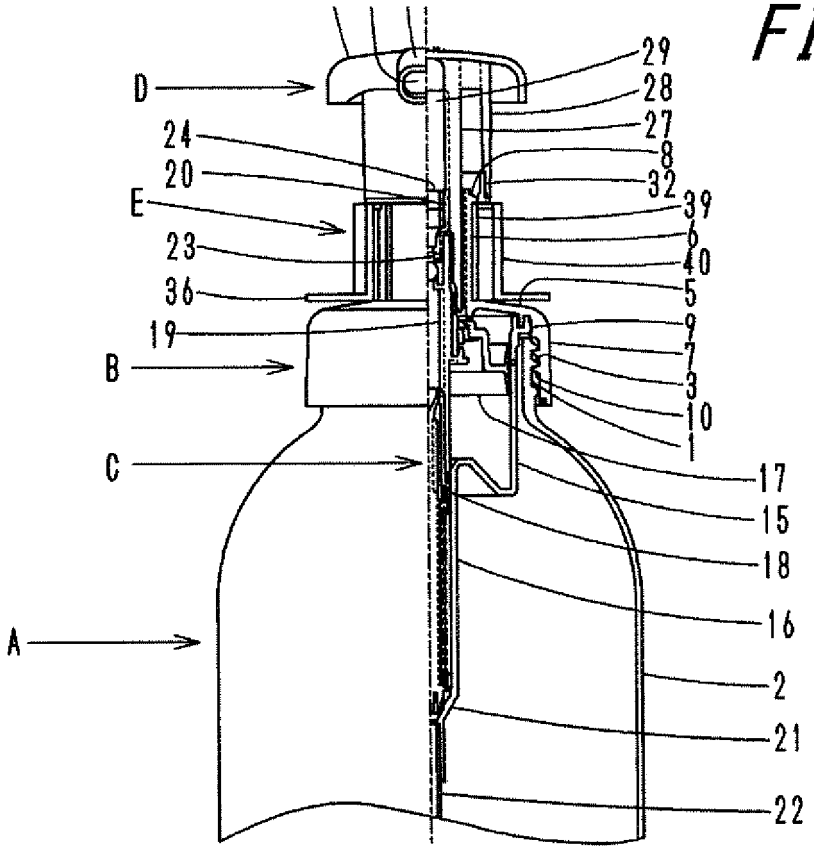
FIG. 1B



Description

TECHNICAL FIELD

[0001] The present disclosure relates to a pump dispenser, especially to a pump stopper inserted detachably between a nozzle head and an attachment cap of a dispenser.

BACKGROUND

[0002] As is conventionally known, a pump dispenser may include an attachment cap fitted to a mouth tubular portion of a container main body containing a content liquid, a pump provided in a lower portion thereof with a drawing pipe, and a nozzle head fitted to an upper portion of the pump, and such a dispenser dispenses the content liquid contained in the container main body through a nozzle port provided in the nozzle head by drawing up the content liquid through the drawing pipe in response to the nozzle head being depressed.

[0003] In such a dispenser, to prevent the content liquid from being dispensed in response to external force applied intentionally or uninteritionally during distribution, storage, or merchandising and display, it is also conventionally known to insert a pump stopper between the nozzle head and the attachment cap to hinder the nozzle head from being depressed, thereby preventing the content liquid contained in the container main body from being dispensed unintentionally (refer to, for example, Patent Literatures 1 and 2).

CITATION LIST

Patent Literatures

[0004]

PTL 1: JP 2007038048A

PTL 2: JP 2009056404A

SUMMARY

(Technical Problems)

[0005] However, in a dispenser described in each of Patent Literatures 1 and 2, when the pump stopper is removed in use, the removed pump stopper is not necessary any more, and this invokes the need for disposing of the pump stopper straight away or, if it is expected to be used again, storing the pump stopper separately.

[0006] Moreover, in cases where a finger-pressing member is added to an existing dispenser, the need for the additional member incurs additional manufacturing cost and also increases the number of members, and accordingly, increases environmental load.

[0007] Moreover, although one possible way to solve the above problem is to integrate the finger-pressing member with the attachment cap as in the dispenser described in Patent Literature 2, the finger-pressing member, when being integrated with the attachment cap, may disturb a user who does not need the finger-pressing member.

[0008] The present disclosure is to solve the above problems, and the present disclosure is to provide a pump stopper that does not invoke the need for disposing of the pump stopper, which is indispensable during distribution of the dispenser, that may be used while remaining inserted to the dispenser, and that may also be used as the finger-pressing member without the need for additionally increasing the number of members.

(Solution to Problems)

[0009] One of aspects of the present disclosure for solving the above problems resides in a pump stopper configured to be inserted detachably to a dispenser including: an attachment cap that is fitted to a mouth tubular portion of a container main body and that has a top wall; a pump that is fitted to the attachment cap; and a nozzle head that is fitted to an upper end of the pump and that has a tubular body extending vertically downward. The pump stopper includes a substantially cylindrical-shaped stopper main body provided with a side opening in a manner such that the stopper main body is C-shaped in an upper view thereof, and the stopper main body includes, on one of an upper end side and a lower end side thereof, a regulating portion that prevents the tubular body of the nozzle head from being displaced downward, and, on another one of the upper end side and the lower end side thereof, a space portion that allows the tubular body of the nozzle head to be displaced downward when the pump stopper is inserted between the top wall of the attachment cap and the tubular body of the nozzle head.

[0010] In a preferred embodiment of the pump stopper, the pump stopper further includes a finger-pressing member that extends radially outward from the stopper main body.

[0011] In another preferred embodiment of the pump stopper, the stopper main body further includes: an inner tubular wall, which is formed in a cylindrical shape a portion of which is cut away circumferentially along side end surfaces thereof; and an outer tubular wall, which is connected to an outer circumferential side of the inner tubular wall with a predetermined distance therebetween and which is formed in a cylindrical shape a portion of which is cut away circumferentially along side end surfaces thereof. The space portion is defined between the inner tubular wall and the outer tubular wall, and one of an upper end side and a lower end side of each of the inner tubular wall and the outer tubular wall is connected each other as the regulating portion.

[0012] In yet another preferred embodiment of the pump stopper, the regulating portion includes at least one connecting piece that connects an end portion of the

inner tubular wall and an end portion of the outer tubular wall, the stopper main body further includes a tab portion that extends radially outward on an opposite side to the side opening.

(Advantageous Effects)

[0013] The pump stopper according to the present disclosure includes a substantially cylindrical-shaped stopper main body provided with a side opening in a manner such that the stopper main body is C-shaped in an upper view thereof, and the stopper main body includes, on one of an upper end side and a lower end side thereof, a regulating portion that prevents the tubular body of the nozzle head from being displaced downward, and, on another one of the upper end side and the lower end side thereof, a space portion that allows the tubular body of the nozzle head to be displaced downward when the pump stopper is inserted between the top wall of the attachment cap and the tubular body of the nozzle head. Accordingly, when the pump stopper is inverted upside-down and inserted to the dispenser in a manner such that an end side of the stopper main body that includes the regulating portion opposes to the top wall of the attachment cap, the tubular body of the nozzle head may be displaced downward in the space portion defined between the inner tubular wall and the outer tubular wall of the stopper main body. This allows the dispenser to be used, with the pump stopper being inserted.

[0014] Furthermore, the pump stopper according to the present disclosure includes the finger-pressing member that extends radially outward from the stopper main body. Accordingly, during distribution, the pump stopper may serve as a normal pump stopper, and, during use, the pump stopper may be inverted upside-down and inserted to the dispenser, and thus, may also be used as a finger-pressing member.

[0015] This omits the need for additionally providing the finger-pressing member and contributes to a reduction in cost and environmental load.

[0016] Moreover, the regulating portion includes at least one connecting piece that connects an end portion of the inner tubular wall and an end portion of the outer tubular wall. Accordingly, the inner tubular wall and the outer tubular wall are more likely to be deformed, and this facilitates insertion of the pump stopper to the dispenser, compared with cases where the end portion of the inner tubular wall and the end portion of the outer tubular wall are connected all over the circumferential direction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] In the accompanying drawings:

FIGs. 1A and 1B are respectively an upper view and a front half-sectional view, each illustrating the state where a pump stopper is inserted to a dispenser during distribution according to Embodiment 1 of the present disclosure;

FIG. 2 is a side sectional view illustrating the state where a pump stopper is inserted to a dispenser during distribution according to Embodiment 1 of the present disclosure;

FIG. 3 is a front half-sectional view illustrating the state where a pump stopper is inserted to a dispenser during use according to Embodiment 1 of the present disclosure;

FIGs. 4A and 4B are each a perspective view illustrating a pump stopper according to Embodiment 1 of the present disclosure, with FIG. 4A illustrating the state where the pump stopper is used as a stopper, and FIG. 4B illustrating the state where the pump stopper is used as a finger-pressing member;

FIGs. 5A and 5B are respectively an upper view and a front half-sectional view, each illustrating the state where a pump stopper is inserted to a dispenser during distribution according to Embodiment 2 of the present disclosure;

FIG. 6 is a front half-sectional view illustrating the state where a pump stopper is inserted to a dispenser during use according to Embodiment 2 of the present disclosure; and

FIGs. 7A and 7B are each a perspective view illustrating a pump stopper according to Embodiment 2 of the present disclosure, with FIG. 7A illustrating the state where the pump stopper is used as a stopper, and FIG. 7B illustrating the state where the pump stopper is used as a finger-pressing member.

DETAILED DESCRIPTION

[0018] Preferred embodiments of the present disclosure are described below with reference to the drawings.

[Embodiment 1]

[0019] In FIGs. 1A, 1B, and 2, reference numeral A denotes a container main body containing a content liquid, reference numeral B denotes an attachment cap fitted to the container main body A, reference numeral C denotes a pump fitted to the attachment cap, reference numeral D denotes a nozzle head fitted to an upper end of the pump C, and reference numeral E denotes a pump stopper inserted detachably between the nozzle head D and the attachment cap B.

[0020] Additionally, in the following description, an upper direction as seen in FIG. 1B is defined as "upward", and a lower direction as seen in FIG. 1B is defined as "downward".

[0021] A dispenser is formed by assembling the attachment cap B, the pump C, and the nozzle head D.

[0022] The container main body A includes a mouth tubular portion 1 and a trunk 2. The mouth tubular portion 1 is provided, on an outer circumference thereof, with a male screw 3 to which the attachment cap B is screwed.

[0023] The attachment cap B includes a top wall 5, a guide tube 6 extending in a standing manner through a middle portion of the top wall 5, and a side circumferential wall 7 extending vertically downward from an outer circumferential edge of the top wall 5.

[0024] The guide tube 6, on an inner circumference thereof, guides the nozzle head D being displaced upward and downward as described later, and the guide tube 6 is also provided, in an outer circumferential upper end thereof, with an engagement protruding ridge 8.

[0025] The side circumferential wall 7 is provided, in an inner circumferential upper end thereof, with an engagement portion 9 that engages with the pump C, and the side circumferential wall 7 is also provided, below the engagement portion 9, with a female screw 10 that is screwed to the male screw 3.

[0026] As illustrated in FIG. 2, the pump C includes a large-diameter air cylinder 15, which is fitted via the engagement portion 9 to the inner circumferential upper end of the side circumferential wall 7 included in the attachment cap B, and a small-diameter liquid cylinder 16, which extends vertically below the air cylinder 15 coaxially.

[0027] Inside the liquid cylinder 16 and the air cylinder 15, a stem 19, which is urged upward with respect to the attachment cap B, is fitted in a manner such that the step 19 is displaceable upward and downward. The stem 19 has a tubular shape with open upper and lower ends, and a liquid piston 18 is fitted to a lower portion of the stem 19, and an air piston 17, which slides inside the air cylinder 15, is also coupled to an outer circumferential upper portion of the stem 19.

[0028] The liquid cylinder 16 has a bottom portion from which a pipe holding tube 21 extends integrally, and to the pipe holding tube 21, a drawing pipe 22 is connected.

[0029] Between the stem 19 and a fitting tubular portion 20, there is defined an air-liquid mixing chamber 23, in which a liquid from the liquid cylinder 16 and air from the air cylinder 15 join. In the fitting tubular portion 20, which communicates with the air-liquid mixing chamber 23, two foaming members 24 are fitted.

[0030] In the present embodiment, a pair of ring bodies, with meshes having different coarseness being stretched, is fitted as the foaming members 24. However, a single ring body, with a mesh being stretched, may be fitted, or three or more meshes may be fitted, and any of these may be selected as needed.

[0031] To an upper end of the stem 19, the fitting tubular portion 20 is fitted, and moreover, a lower end of a fitting tubular body 27 included in the nozzle head D, which is described later, is fitted.

[0032] The inside of the pump C is configured in a known manner and not limited to a particular configuration, as long as the pump C may supply the content liquid and air and may allow the mixed liquid and air to be foamed through the foaming members and dispensed through the nozzle.

[0033] As illustrated in FIGs. 1A, 1B, and 2, the nozzle head D includes a head portion 26 provided, on one side thereof, with a nozzle 25, fitting tubular body 27 extending vertically below the head portion 26, and a tubular body 28.

[0034] Inside the fitting tubular body 27, a circulation path 29 is defined in communication with the stem 19, and a dispensing path 30, which communicates with the circulation path 29 and extends to a front end of the nozzle 25, is also provided, with a front end thereof forming a nozzle port 31.

[0035] To an inner circumference of a lower end of the tubular body 28, an engagement member 32 is fitted, and a small gap is defined with respect to an outer circumference of the guide tube 6 (the engagement protruding ridge 8) included in the attachment cap B.

[0036] As illustrated in FIGs. 4A and 4B, the pump stopper E includes a substantially cylindrical-shaped stopper main body 35 that is provided with a side opening 38 in a manner such that the stopper main body 35 is C-shaped in an upper view thereof and that is inserted to the outer circumference of the guide tube 6 included in the attachment cap B. The pump stopper E further includes two finger-pressing members 36, which extend radially outward from an outer circumferential lower end side of the stopper main body 35, and a tab portion 37 extending radially outward from an outer circumferential upper end side of the stopper main body 35.

[0037] The tab portion 37 is arranged on an opposite side to the side opening 38 of the stopper main body 35, and the two finger-pressing members 36 are each arranged to foam an angle of approximately 90 degrees with respect to the tab portion 37.

[0038] Although in the present embodiment the two finger-pressing members 36 are provided, the finger-pressing members may be omitted or, if provided, the shapes and the positions thereof may be suitably selected.

[0039] Furthermore, in the present embodiment, the tab portion 37 has a flat-plate shape extending horizontally from the outer circumferential upper end side of the stopper main body 35 and includes an anti-slippery convex portion 37a formed on an upper surface of the tab portion 37. However, the shape of the tab portion 37 may be suitably selected and may be, for example, an elongated flat-plate shape.

[0040] The stopper main body 35 includes an inner tubular wall 39, which is formed in a cylindrical shape a portion of which is cut away circumferentially along side end surfaces 39a, an outer tubular wall 40, which is connected to an outer circumferential side of the inner tubular wall 39 with a predetermined distance therebetween and which is formed in a cylindrical shape a portion of which is cut away circumferentially along end surfaces 40a similarly to the inner tubular wall 39, and flat plate-shaped connecting pieces 41, which connect an upper end side 39b of the inner tubular wall 39 and an upper end side 40b of the outer tubular wall 40 at three positions and which each has a fan shape in an upper view.

[0041] Between the inner tubular wall 39 and the outer

tubular wall 40 and from the lower end side to the connecting pieces 41 on the upper end side, there is defined a space portion 42, which permits the tubular body 28 of the nozzle head D to be displaced downward, and the three connecting pieces 41 serve as regulating portions that hinder the nozzle head D from being depressed.

[0042] Here, a description is given of modes of use and advantageous effects of the present embodiment.

[0043] Firstly, when the pump stopper E is inserted to the guide tube 6 included in the attachment cap B in manufacturing or the like of the dispenser in which the attachment cap B, the pump C, and the nozzle head D are assembled, as illustrated in FIGs. 1A, 1B, and 4A, the tab portion 37 is held and pushed radially inward in the state where the side opening 38 of the stopper main body 35 faces to the guide tube 6 so that the upper end side of the stopper main body 35 that includes the three connecting pieces 41 as the regulating portions opposes to the lower end portion of the tubular body 28 included in the nozzle head D.

[0044] At this time, the side end surfaces 39a of the inner tubular wall 39 of the stopper main body 35 firstly abuts against an outer circumferential surface of the guide tube 6, and as the stopper main body 35 is pushed radially inward in this state, the side end surfaces 39a of the inner tubular wall 39 are stretched out due to elastic deformation, and, correspondingly, the outer tubular wall 40, which is connected to the inner tubular wall 39 by the connecting pieces 41, is inserted to the guide tube 6 while undergoing elastic deformation.

[0045] Thus, the pump stopper E is inserted to the guide tube 6.

[0046] Additionally, although in the present embodiment the three connecting pieces 41 are used to connect the upper end side 39b of the inner tubular wall 39 and the upper end side 40b of the outer tubular wall 40, the number of the connecting pieces 41 may be increased or reduced as needed, and even a single connecting piece may be used to connect the inner tubular wall 39 and the outer tubular wall 40 over the entire circumferences.

[0047] Preferably, a single connecting piece is used for connection, because, by doing so, the inner tubular wall 39 and the outer tubular wall 40 are more likely to be deformed, and this facilitates insertion of the pump stopper E to the dispenser, compared with cases where the upper end side 39b of the inner tubular wall 39 and the upper end side 40b of the outer tubular wall 40 are connected all over the circumferential direction.

[0048] Furthermore, in cases where the finger-pressing members 36 of the pump stopper E are not required, the outer tubular wall 40 may be omitted in the stopper main body 35. In this case, only the inner tubular wall 39, and the connecting pieces 41 and the tab portion 37, which extend radially outward from the outer circumferential upper end side of the inner tubular wall 39, may be provided, and the configuration of the pump stopper E is simplified.

[0049] Thus, in the state where the pump stopper E is inserted to the guide tube 6, the three connecting pieces 41, as the regulating portions provided on the upper end side of the stopper main body 35, are close to or in abutment with a lower end edge of the tubular body 28 included in the nozzle head D, and the lower end side of the stopper main body 35 is located above the top wall 5 included in the attachment cap B. This hinders downward displacement of the nozzle head D.

[0050] Subsequently, when the pump stopper E is removed from the guide tube 6 in use or the like of the dispenser, the tab portion 37 is pulled radially outward (in an arrow direction in FIG. 1A. Then, both circumferential end edges of the inner tubular wall 39 included in the stopper main body 35 are stretched out due to elastic deformation, and, correspondingly, the outer tubular wall 40, which is connected to the inner tubular wall 39 by the connecting pieces 41, undergoes elastic deformation. Thus, the pump stopper E is removed from the guide tube 6.

[0051] Subsequently, as illustrated in FIG. 3, after being removed from the guide tube 6, the pump stopper E is inverted upside-down and inserted to the guide tube 6 in a manner such that the three connecting pieces 41 are located above the top wall 5 included in the attachment cap B.

[0052] This allows, when the nozzle head D is depressed, the lower end edge of the tubular body 28 to be displaced downward in the space portion 42 defined in the stopper main body 35.

[0053] Furthermore, when the finger-pressing members 36 are used, fingers may be pressed up against the finger-pressing members 36 for one-handed operation.

[0054] To dispense the content liquid in the form of foam, the nozzle head D is depressed. Then, the stem 11, which is fitted to the fitting tubular body 27, is depressed and pressurizes the liquid contained in the liquid cylinder 16 and air contained in the air cylinder 15. Consequently, the liquid and air are supplied to the air-liquid mixing chamber 23 to be joined, foamed through the foaming members 24, and subsequently, pass through the circulation path 29 and the dispensing path 30 and are dispensed to the outside from the nozzle port 31 included in the nozzle head D.

[0055] Additionally, although in the present embodiment a so-called foamer pump that dispenses the liquid in the form of foam from the nozzle is illustrated as the dispenser, a pump that dispenses the liquid from the nozzle without foaming the liquid may be used instead of the foamer pump or, alternatively, a so-called aerosol dispenser may also be used.

[Embodiment 2]

[0056] Next, a description is given of Embodiment 2 in which the configuration of the finger-pressing member is changed.

[0057] Regarding the present embodiment, the same

constituent portions as those in the first embodiment are denoted by the same reference numerals, and a detailed description thereof is omitted, and the description focuses on differences.

[0058] In FIGs. 5A and 5B, reference numeral A denotes the container main body containing a content medium, reference numeral B denotes the attachment cap fitted to the container main body A, reference numeral C denotes the pump fitted to the attachment cap, reference numeral D denotes the nozzle head fitted to an upper end of the pump C, and reference numeral F denotes a pump stopper detachably inserted between the nozzle head D and the attachment cap B.

[0059] As illustrated in FIGs. 7A and 7B, the pump stopper F includes the stopper main body 35, which is inserted to the outer circumference of the guide tube 6 included in the attachment cap B, and two finger-pressing members 43, which extend radially outward from the outer circumferential upper end side of the stopper main body 35, and the tab portion 37.

[0060] The tab portion37 is arranged on the opposite side to the side opening 35 of the stopper main body 35, and the two finger-pressing members 43 are each arranged to foam an angle of approximately 90 degrees with respect to the tab portion 37.

[0061] Here, a description is given of modes of use and advantageous effects of the present embodiment.

[0062] The pump stopper F according to the present embodiment differs from the pump stopper E according to the Embodiment 1 in that the positions of the finger-pressing members 36 and the length of each finger-pressing member 36 in the radial direction are changed.

[0063] That is to say, in the present embodiment, the finger-pressing members 43 are arranged on the outer circumferential upper end side of the stopper main body 35, and the finger-pressing members 43 extend further outward than an outer edge of the attachment cap B.

[0064] Accordingly, even when being used in a dispenser that is smaller than that in Embodiment 1, the pump stopper F according to the present embodiment allows, during use in which the pump stopper F is inverted upside-down, the finger-pressing members 43 and the head portion 26 to be positioned at an appropriate distance, by increasing the distance between the finger-pressing members 43 and the head portion 26.

[0065] Furthermore, similarly to Embodiment 1, the configuration of the pump stopper F is simplified. That is to say, the outer tubular wall 40 may be omitted in the stopper main body 35, and only the inner tubular wall 39, and the connecting pieces 41, the finger-pressing members 43, and the tab portion 37, which extend radially outward from the outer circumferential upper end side of the inner tubular wall 39, may be provided.

[0066] In this case, unlike Embodiment 1, the finger-pressing members 43 may be provided.

[0067] Other advantageous effects are substantially the same as those in Embodiment 1.

INDUSTRIAL APPLICABILITY

[0068] A pump stopper according to the present disclosure is applicable to a dispenser including a foamer pump that dispenses a content liquid from a nozzle and other types of a dispenser, such as a dispenser that dispenses a content liquid directly in the form of liquid, a spray dispenser that sprays a content liquid in the form of atomized particles, and an aerosol dispenser. During distribution, the pump stopper serves as a normal pump stopper, and during use, the pump stopper is inverted upside-down and inserted to a dispenser. Accordingly, the pump stopper does not need to be stored separately, and if needed, may also be used as a finger-pressing member. Thus, the pump stopper may be widely used as a pump stopper in a pump dispenser, especially as a pump stopper for a container filled with a content medium, such as a cleanser and a cosmetic product, for which a nozzle head of the dispenser needs to be depressed during use.

REFERENCE SIGNS LIST

[0069]

A	Container main body
B	Attachment cap
C	Pump
D	Nozzle head
E, F	Pump stopper
1	Mouth tubular portion
2	Trunk
3	Male screw
5	Top wall
6	Guide tube
7	Side circumferential wall
8	Engagement protruding ridge
9	Engagement portion
10	Female screw
15	Air cylinder
16	Liquid cylinder
17	Air piston
18	Liquid piston
19	Stem
20	Fitting tubular portion
21	Pipe holding tube
22	Drawing pipe
23	Gas-liquid mixing chamber
24	Foaming member
25	Nozzle
26	Head portion
27	Fitting tubular body
28	Tubular body
29	Circulation path
30	Dispensing path
31	Nozzle port
32	Engagement member
35	Stopper main body

36, 43	Finger-pressing member
37	Tab portion
37a	Anti-slippery convex portion
38	Side opening
39	Inner tubular wall
39a, 40a	Side end surfaces
39b, 40b	Upper end side
40	Outer tubular wall
41	Connecting piece (regulating portion)
42	Space portion

Claims

1. A pump stopper configured to be inserted detachably to a dispenser including: an attachment cap that is fitted to a mouth tubular portion of a container main body and that has a top wall; a pump that is fitted to the attachment cap; and a nozzle head that is fitted to an upper end of the pump and that has a tubular body extending vertically downward, wherein
the pump stopper comprises a substantially cylindrical-shaped stopper main body provided with a side opening in a manner such that the stopper main body is C-shaped in an upper view thereof, and
the stopper main body includes, on one of an upper end side and a lower end side thereof, a regulating portion that prevents the tubular body of the nozzle head from being displaced downward, and, on another one of the upper end side and the lower end side thereof, a space portion that allows the tubular body of the nozzle head to be displaced downward when the pump stopper is inserted between the top wall of the attachment cap and the tubular body of the nozzle head.

2. The pump stopper according to claim 1, wherein the pump stopper further includes a finger-pressing member that extends radially outward from the stopper main body.

3. The pump stopper according to claim 1 or 2, wherein the stopper main body further includes: an inner tubular wall, which is formed in a cylindrical shape a portion of which is cut away circumferentially along side end surfaces thereof; and an outer tubular wall, which is connected to an outer circumferential side of the inner tubular wall with a predetermined distance therebetween and which is formed in a cylindrical shape a portion of which is cut away circumferentially along side end surfaces thereof, and wherein the space portion is defined between the inner tubular wall and the outer tubular wall, and one of an upper end side and a lower end side of each of the inner tubular wall and the outer tubular wall is connected each other as the regulating portion.

4. The pump stopper according to claim 3, wherein the regulating portion comprises at least one connecting piece that connects an end portion of the inner tubular wall and an end portion of the outer tubular wall.

5. The pump stopper according to one of claims 1 to 4, wherein the stopper main body further includes a tab portion that extends radially outward on an opposite side to the side opening.

FIG. 1A

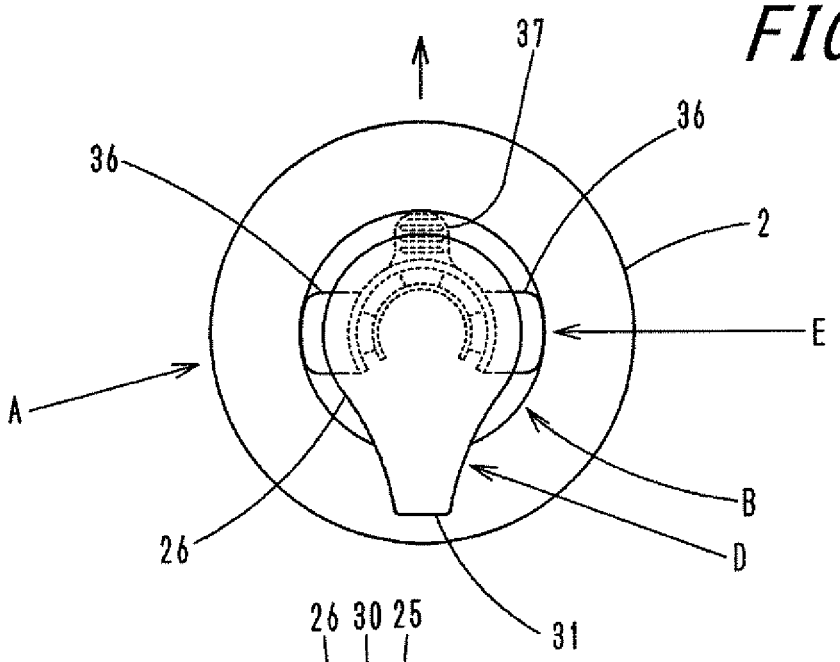
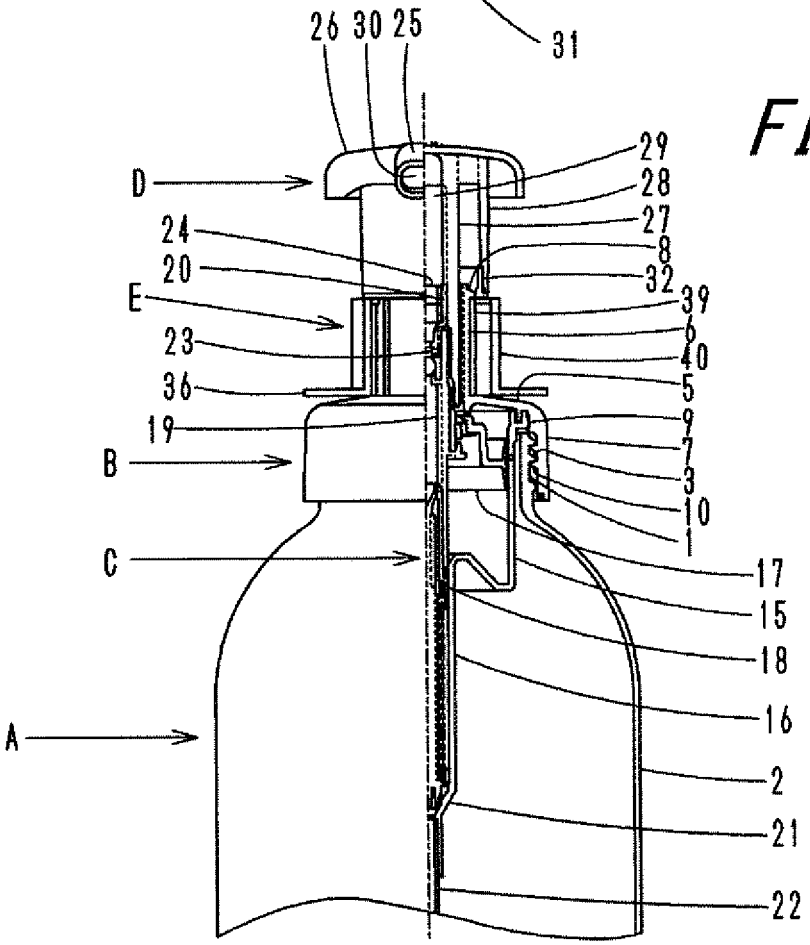

37
36
36
2
E
A
B
D
26
31

FIG. 1B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D
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40
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FIG. 2

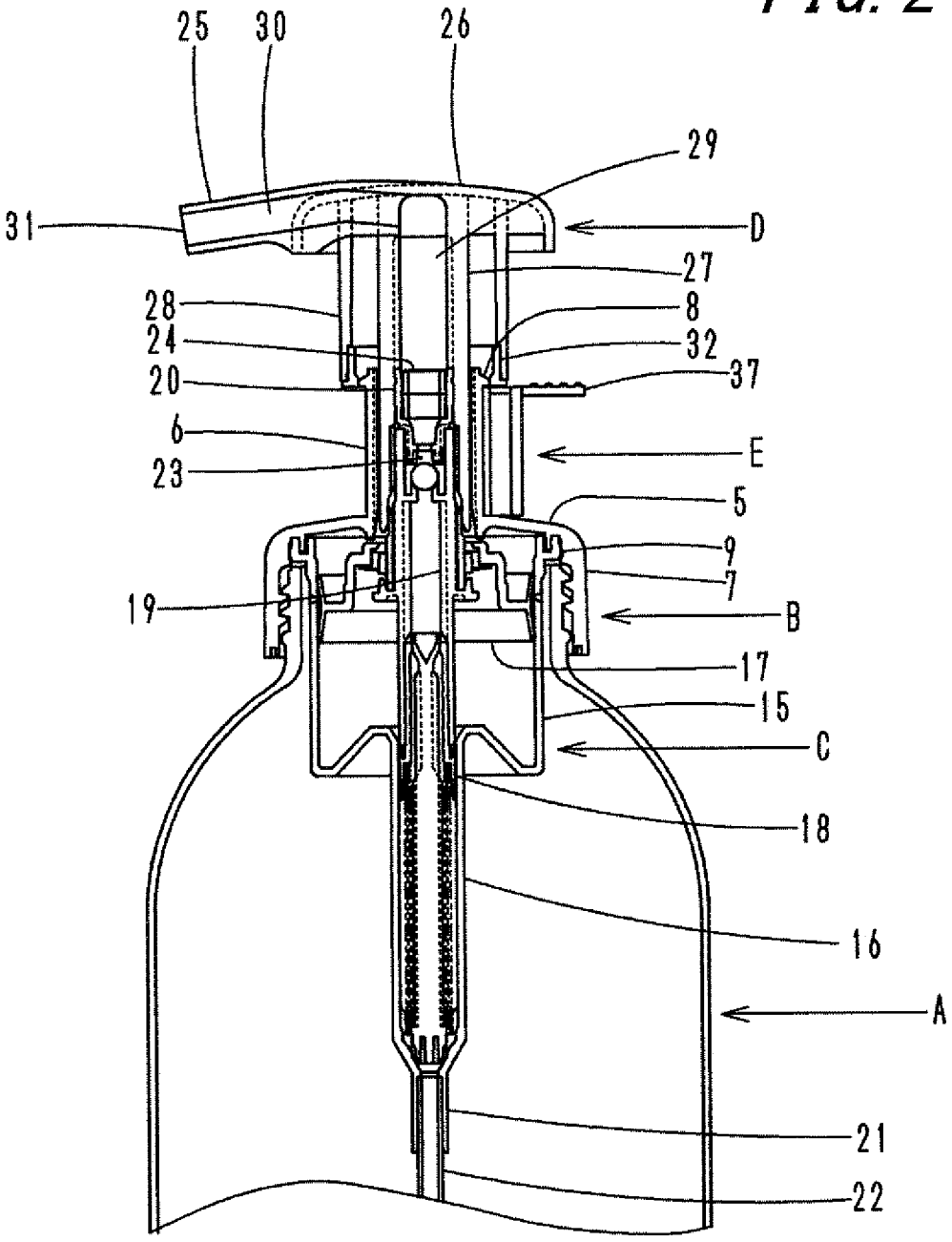

FIG. 3

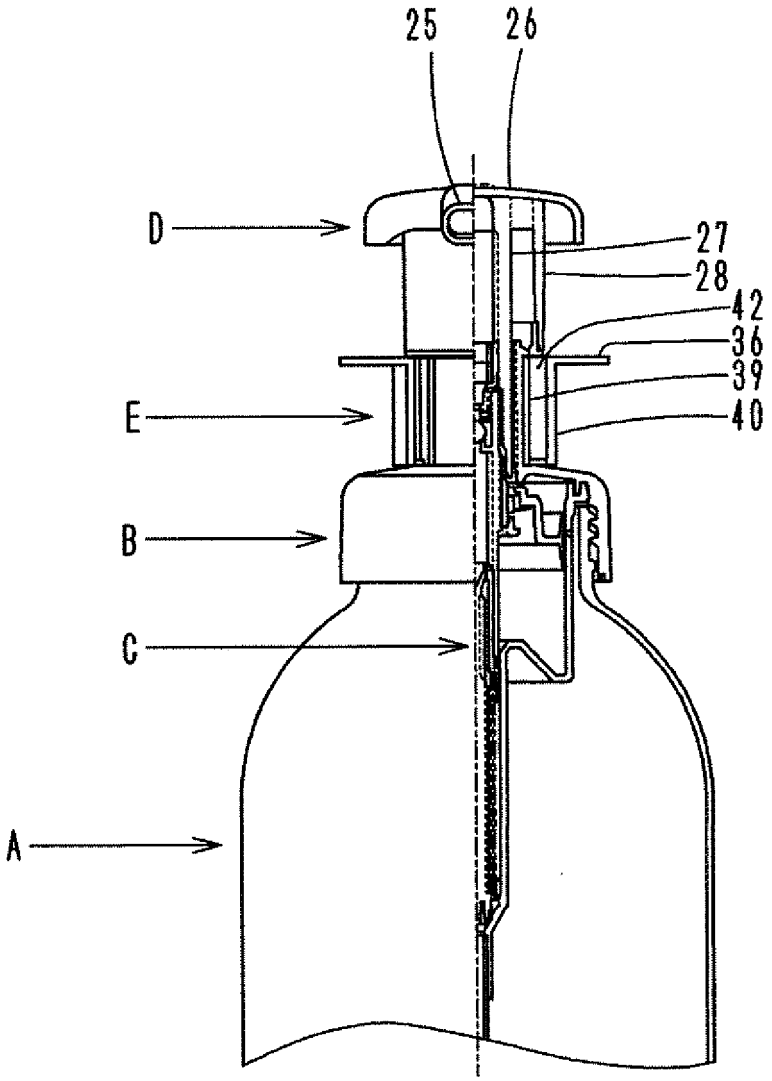

FIG. 4A

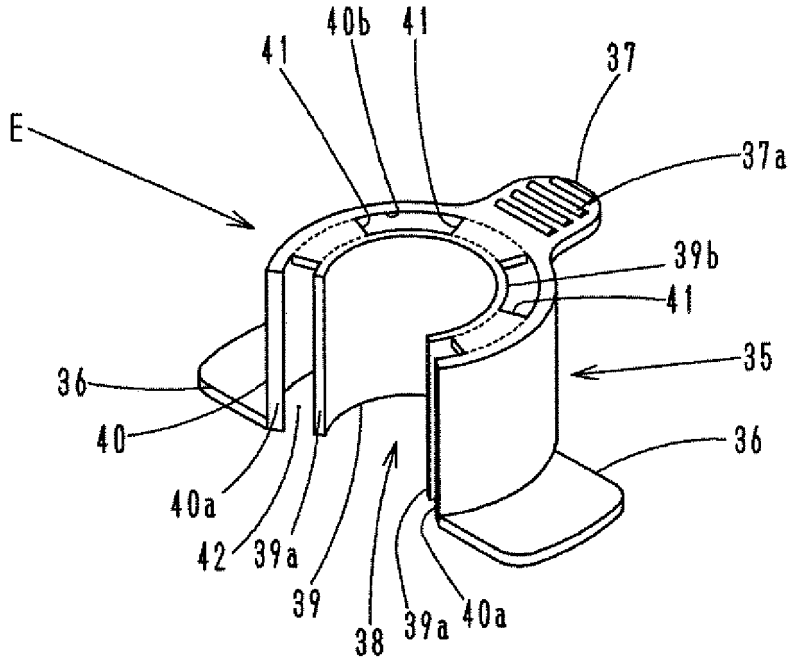
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FIG. 4B

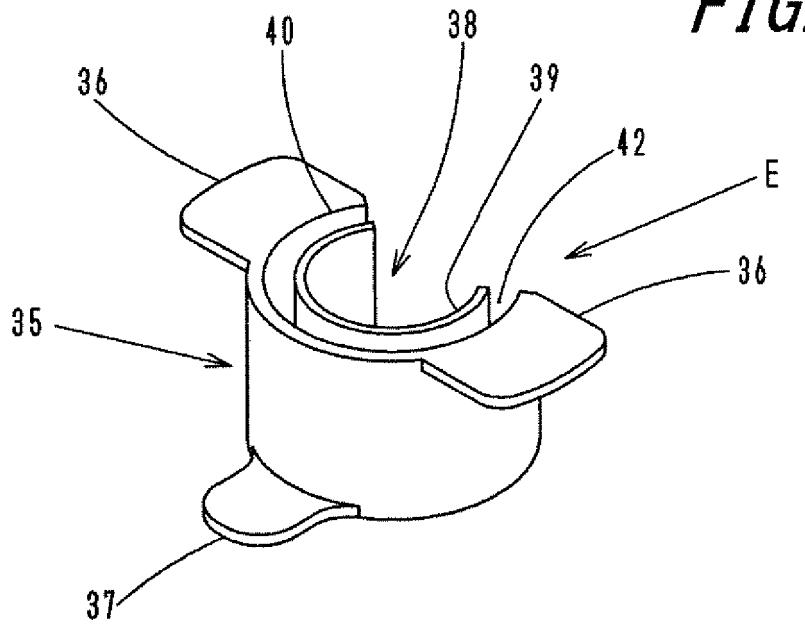
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FIG. 5A

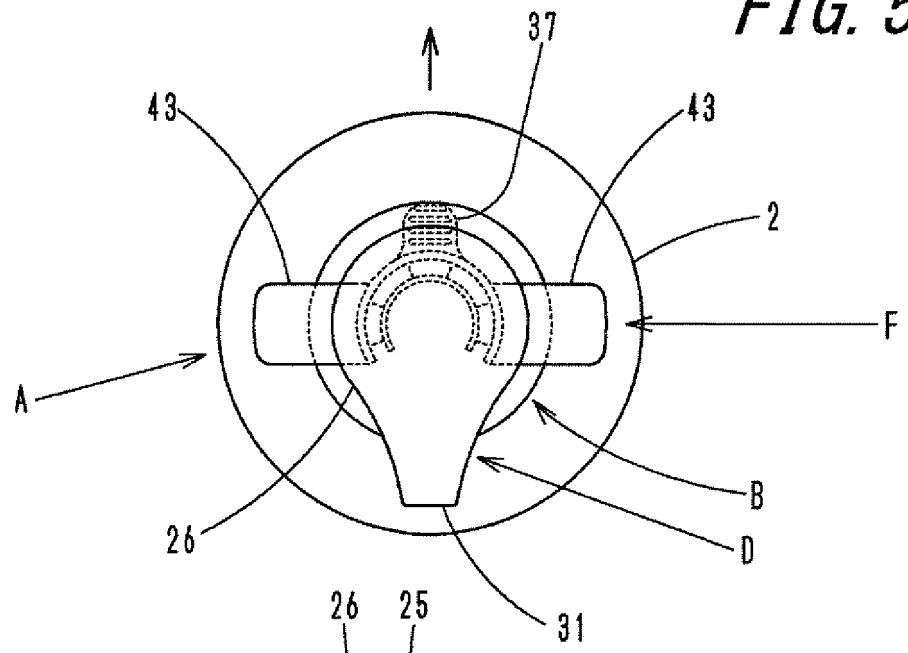

FIG. 5B

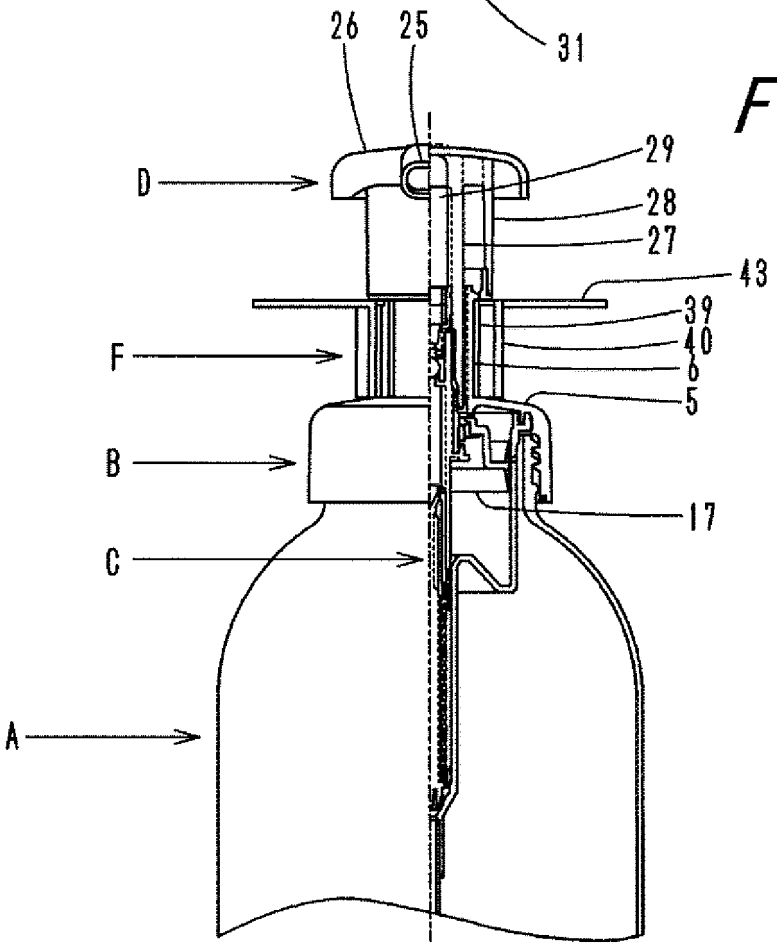

FIG. 6

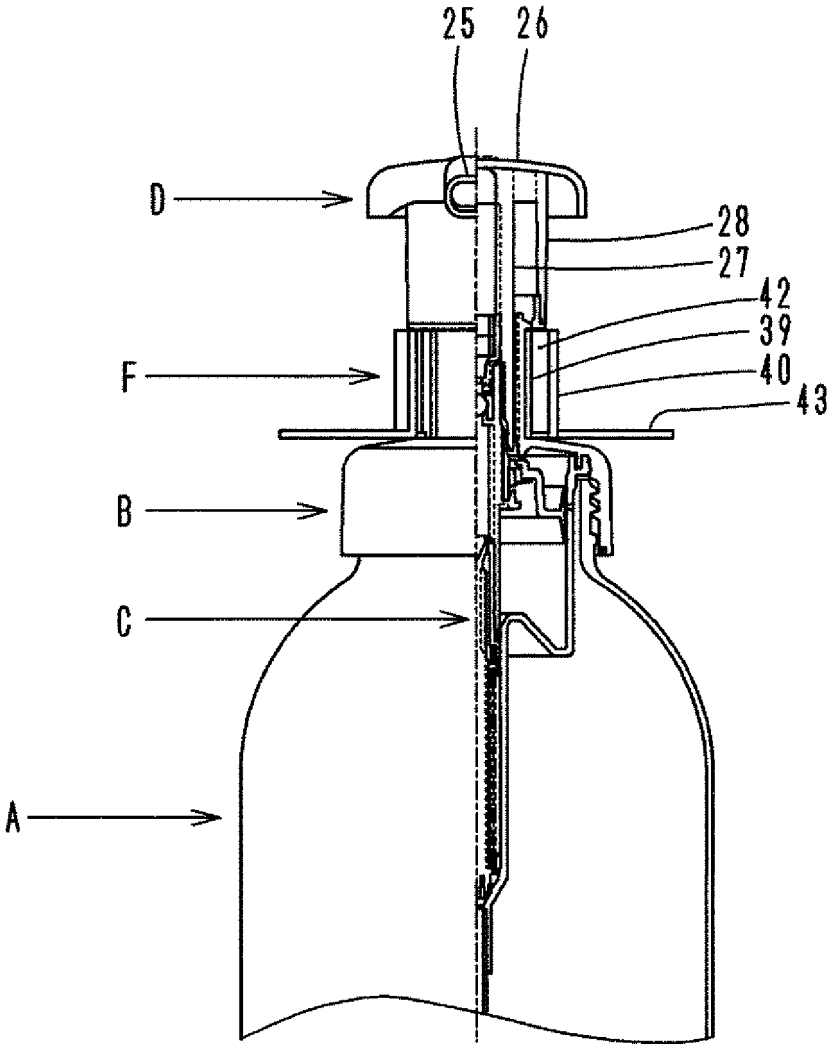

FIG. 7A

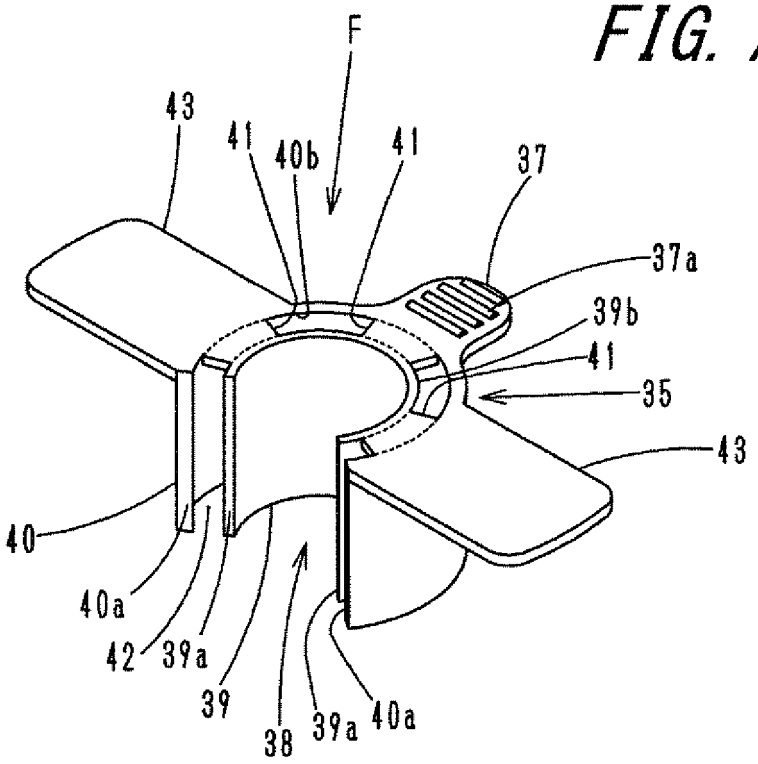
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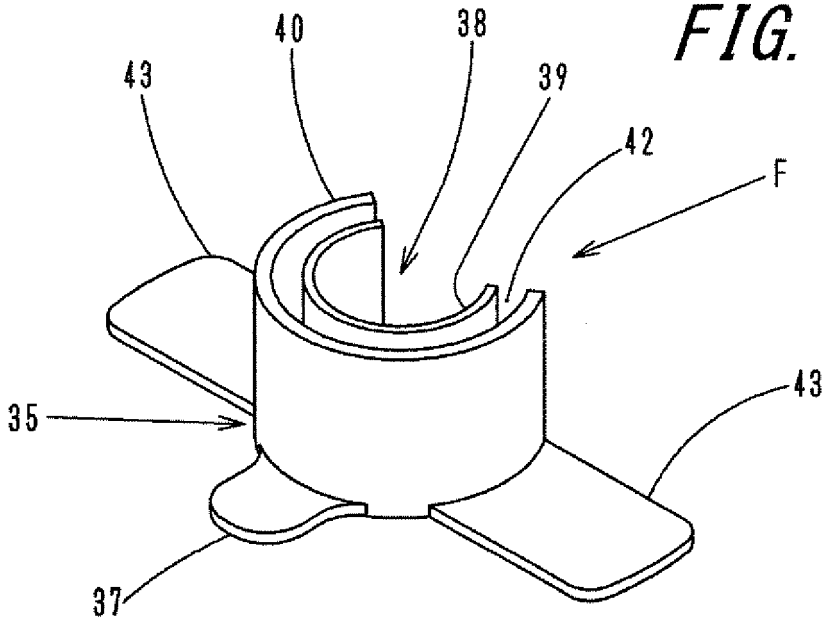
FIG. 7B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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2015/001828

A. CLASSIFICATION OF SUBJECT MATTER
B65D47/34(2006.01)i, *B05B11/00*(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)
B65D47/34, B05B11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2015
Kokai Jitsuyo Shinan Koho 1971-2015 Toroku Jitsuyo Shinan Koho 1994-2015

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	JP 2009-120234 A (Lion Corp.), 04 June 2009 (04.06.2009), paragraphs [0003] to [0049]; fig. 1 to 9 (Family: none)	1-2,5 3-4
A	JP 2009-286486 A (Mitani Valve Co., Ltd.), 10 December 2009 (10.12.2009), paragraphs [0005] to [0027]; fig. 1 to 6 (Family: none)	1-5
A	JP 2010-120701 A (Yoshino Kogyosho Co., Ltd.), 03 June 2010 (03.06.2010), paragraphs [0006] to [0031]; fig. 1 to 5 (Family: none)	1-5

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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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
19 June 2015 (19.06.15)	30 June 2015 (30.06.15)
Name and mailing address of the ISA/ Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2015/001828

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 077537/1992(Laid-open No. 035154/1994) (Yoshino Kogyosho Co., Ltd.), 10 May 1994 (10.05.1994), paragraphs [0006] to [0024]; fig. 1 to 2 (Family: none)	2-5
A	JP 2003-165591 A (Yoshino Kogyosho Co., Ltd.), 10 June 2003 (10.06.2003), paragraphs [0003] to [0025]; fig. 1 to 12 (Family: none)	2-5
A	WO 2008/047035 A2 (VALOIS SAS), 24 April 2008 (24.04.2008), description, page 1, line 1 to page 9, line 5; fig. 1a to 9 & JP 2010-506643 A & JP 5066187 B2 & US 2010/0237102 A1 & FR 2907435 A1 & CN 101547845 A	3-5

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- JP 2007038048 A **[0004]**
- JP 2009056404 A **[0004]**