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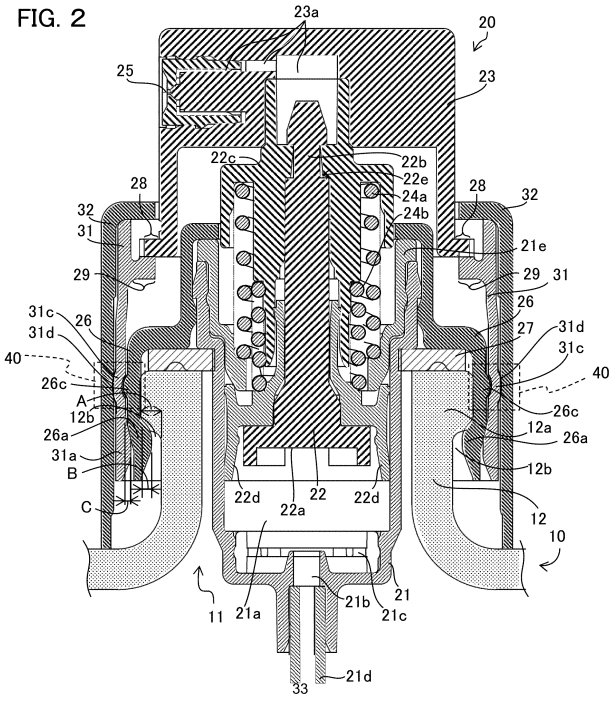
(54) **SEPARABLE/DISPOSABLE SPRAY CONTAINER, AND CONTENT SPRAYING UNIT**

(57) Provided is a spray container capable of removing and separating a pump from a container with a small force after use of contents.

An engagement portion is disposed around a button such that a fastening ring crimping a pump unit to a neck-shaped portion of the container can be pushed down by pressing down the button of the pump unit. Accordingly, after all the contents in the spray container are used, the pump unit can be removed from the neck-shaped portion of the container.

FIG. 2



EP 4 070 889 A1

Description

Technical Field

[0001] The present invention relates to a structure in which a pump attached to an opening of a container and spraying contents in the container cannot be removed from the container at a time of use and can be removed from the container after use to separate the pump from the container.

Background Art

[0002] A spray container in which a pump is attached to an opening portion of a container storing contents is widely used. When such a spray container is operated by pushing down the pump or the like, the contents in the container are suctioned up by an action of a pressure of the pump, and are sprayed from a hole at a tip end of the pump. It is known that the spray container has a structure in which a spraying unit is detachably attached to the container by screw fitting or the like such that the contents can be replenished or replaced.

[0003] On the other hand, in fields of perfumes, cosmetics, and medicines, there is also known a structure in which the pump cannot be removed from the container for a reason of maintaining a quality of the contents or the like. For example, the spray container that is crimped around an opening of the container by applying a force to a part of a pump component to plastically deform the pump is sold.

[0004] PTL 1 proposes a structure in which a portion (breaking means) having a low strength is provided in a ring-shaped member for fixing a pump to a neck portion of a container in order to recycle a pump (dispenser) portion after use. Accordingly, it is described that an operator can quickly and cleanly remove the dispenser from the container by breaking the portion having a low strength of the ring-shaped member.

Citation List

Patent Literature

[0005] PTL 1: JP-A-2012-511480

Summary of Invention

Technical Problem

[0006] In recent years, in order to reuse resources, there is a trend to thoroughly separate and collect waste by material. Even for the spray container in which the spraying unit cannot be removed from the container, when the container and the spraying unit are made of different materials (for example, glass and metal, glass and a resin, metal and a resin, or the like), it is necessary to remove the spraying unit from the container after use and discard the spraying unit and the container. Therefore, a user (consumer) may pry open the spraying unit with a plier after use to remove the spraying unit from the neck portion of the container and discard the spraying unit and the container.

[0007] In a spray container disclosed in PTL 1, the dispenser (pump) can be removed from the container by the operator applying a force to break a part of the ring-shaped member. However, when the user (consumer) himself/herself removes the dispenser from the container, an operation of breaking the ring-shaped member is not easy for a user with a weak force.

[0008] An object of the invention is to provide a spray container capable of removing and separating a pump from a container with a small force after use of contents.

Solution to Problem

[0009] In order to achieve the above object, a spray container of the invention includes: a container that includes a neck-shaped portion around an opening; a pump unit that sprays contents in the container; and a fixing tool that fixes the pump unit to the neck-shaped portion. The pump unit includes a cylinder having one portion inserted into the opening, a piston having one end inserted into the cylinder, a button attached to the other end of the piston and pushing the piston into the cylinder, and a support ring disposed to cover an outer periphery of the neck-shaped portion of the opening in an annular shape and supporting the cylinder at an edge portion of the opening. The fixing tool includes a fastening ring disposed such that an inner peripheral surface thereof is in contact with an outer peripheral surface of the support ring, and a fixing ring disposed to be in contact with an outer peripheral surface of the fastening ring. The fastening ring and the fixing ring include a lock mechanism for fixing the support ring to the neck-shaped portion. A part of the button or the piston is provided with an engagement portion that engages with the fastening ring at a predetermined angle when the button or the piston is rotated about an axis thereof. The lock mechanism has a structure in which locking is released when the button is pressed in a state where a part of the button or the piston is engaged with the fastening ring by the engagement portion, and the pump unit is able to be removed from the neck-shaped portion of the container.

Advantageous Effects of Invention

[0010] According to the invention, a spray container capable of removing and separating a pump from a container with a small force after use of contents can be provided.

Brief Description of Drawings

[0011]

[FIG. 1] FIG. 1 is a cross-sectional view of a spray container 1 according to an embodiment of the in-

vention.

[FIG. 2] FIG. 2 is an enlarged cross-sectional view of an upper portion of the spray container 1 according to the embodiment of the invention.

[FIG. 3] FIG. 3 is a perspective view of a pump unit 20 according to the embodiment.

[FIG. 4] (a) of FIG. 4 shows a perspective view of a button 23 according to the embodiment, (b) of FIG. 4 shows a top view of the button 23, and (c) of FIG. 4 shows a front view of a first protrusion of the button 23.

[FIG. 5] (a) of FIG. 5 shows a top view of a fastening ring 31 according to the embodiment, and (b) of FIG. 5 shows a front view of a second protrusion of the fastening ring 31.

[FIG. 6] (a-1) to (d) of FIG. 6 are cross-sectional views showing a procedure of removing the pump unit 20 from the spray container according to the embodiment.

[FIG. 7] FIG. 7 is an enlarged cross-sectional view of a state in which the fastening ring 31 of the spray container 1 according to the embodiment of the invention is pushed down.

[FIG .8] (a) to (c) of FIG. 8 are diagrams showing movements of both a first protrusion 28 and a second protrusion 29 in a case where the first protrusion 28 and the second protrusion 29 collide with each other when the spray container according to the embodiment is manufactured.

Description of Embodiments

[0012] Hereinafter, a separable and disposable spray container 1 according to an embodiment of the invention will be described.

[0013] FIG. 1 is a cross-sectional view of the entire spray container 1, and FIG. 2 is an enlarged cross-sectional view of an upper portion of the spray container 1. FIG. 3 is a perspective view of a pump unit 20.

[0014] As shown in FIG. 1, the spray container 1 of the present embodiment includes a container 10 that includes a neck-shaped portion 12 around an opening 11, the pump unit 20 that sprays contents in the container 10, and a fixing tool 30 that fixes the pump unit 20 to the neck-shaped portion 12 of the container 10. The pump unit 20 and the fixing tool 30 constitute a content spraying unit that sprays the contents in the container 10.

[0015] As shown in FIGS. 2 and 3, the pump unit 20 includes a cylinder 21 having a lower portion inserted inside the opening 11 of the container 10, a piston 22 having a tip end 22a inserted into the cylinder 21, and a button 23 fixed to a rear end 22b of the piston 22.

[0016] Elastic members (here, double springs 24a and 24b) are disposed around the piston 22, and support the piston 22b while biasing the piston 22b with respect to the cylinder 21.

[0017] A through hole 21b is provided at a tip end (lower end) of the cylinder 21, and the through hole 21b is covered with a check valve 21c. A pipe 21d for suctioning up the contents in the container 10 is inserted into the through hole 21b. A cylinder inner tube 21e is fixed to an upper end of the cylinder 21.

[0018] The button 23 is provided with a spraying port 25. Here, piston outer tubes 22c, 22d are disposed around the piston 22 to surround the piston 22, and the piston 22 is fixed to the button 23 via the piston outer tube 22c. A minute gap 22e is provided between an outer peripheral surface of the piston 22 and the piston outer tubes 22c and 55d, and the gap 22e serves as a flow path for guiding the contents in the container 10 from a space 21a of the cylinder 21 to the button 23.

[0019] The piston outer tube 22c isolates the springs 24a and 24b from the piston 22, and the springs 24a and 24b have a configuration of not being in contact with the contents in the container 10.

[0020] The button 23 is provided with a flow path 23a for guiding the contents, which reaches the button 23 through a gap 22b of the piston 22, to the spraying port 25.

[0021] A support ring 26 is fixed to the upper end of the cylinder 21 via the cylinder inner tube 21e. The support ring 26 has a shape that annularly covers an outer periphery of the neck-shaped portion 12 from an edge of the opening 11. The support ring 26 is connected to the cylinder inner tube 21e and an outer peripheral surface of the cylinder 21 at an upper portion of the edge of the opening 11, and supports the cylinder 21 on the edge of the opening 11. Here, a packing 27 is disposed between the edge of the opening 21 and the support ring 26.

[0022] The neck-shaped portion 12 of the container 10 has an edge portion 12a protruding outward in a ring shape, and a concave portion 12b (depth A in a radial direction) is provided at a lower portion of the edge portion 12a. A lower end of the support ring 26 is provided with a convex portion 26a (height B (B < A) in the radial direction) that engages with the concave portion 12b on an inner peripheral surface side.

[0023] The fixing tool 30 includes a fastening ring 31 disposed such that an inner peripheral surface thereof is in contact with an outer peripheral surface of the support ring 26, and a fixing ring 32 disposed on an outer side of the fastening ring 31. The fastening ring 31 and the fixing ring 32 are provided with a lock mechanism 40 for fixing the support ring 26 to the neck-shaped portion 12.

[0024] Here, as an example, the lock mechanism 40 includes a convex portion 26c (or a concave portion) provided on the outer peripheral surface of the support ring 26, and a concave portion 31c (or a convex portion) provided on an inner peripheral surface of the fastening ring 31 at a position corresponding to the convex portion 26c (or the concave portion). When the convex portion 26c (or the concave portion) of the support ring engages with the concave portion 31c (or convex portion) on the inner peripheral surface of the fastening ring 31, the lock mechanism 40 is in a locked state. A pressing convex portion 31d is provided on an outer peripheral surface of the fastening ring 31 at the same position as the concave portion

31c. The fixing ring 32 is disposed to be in contact with the pressing convex portion 31d of the fastening ring 31, and by pressing the fastening ring 31 against the support ring 26 and crimping the fastening ring 31, the convex portion 26c and the concave portion 31c strengthen the engagement and maintain the locked state, and the support ring 26 is fixed to the neck-shaped portion 12.

[0025] On the other hand, as shown in FIG. 3, one or more notches 26b are provided in the support ring 26 in an axial direction. Since the notches 26b are provided, the support ring 26 is deformed and narrowed in the radial direction when the support ring 26 is crimped by the fastening ring 31, and is firmly fixed to the neck-shaped portion 12.

[0026] In the present embodiment, the concave portion 31c, the convex portion 26c and the pressing convex portion 31d are provided in a ring shape along a peripheral direction of the inner peripheral surface of the fastening ring 31 and the outer peripheral surface of the support ring 26.

[0027] To describe each part of the lock mechanism 40 in more detail, since the pressing convex portion 31d is in contact with the fixing ring 32, the fastening ring 31 is pressed against the support ring 26 and pressed by the pressing convex portion 31d, the concave portion 31c and the convex portion 26c are fitted. Thus, a strength of crimping the support ring 26 is increased. Since the convex portion 26c of the support ring 26 and the concave portion 31c of the fastening ring 31 are fitted to each other, the support ring 26 cannot move upward in the axial direction. Accordingly, the lock mechanism 40 prevents the support ring 26 from removing from the neck-shaped portion 12.

[0028] In addition, a lower end of the fastening ring 31 has a height the same as the lower end of the support ring 26, and includes a convex portion 31a (height C in the radial direction) protruding toward the inner peripheral surface side. Accordingly, the convex portion 26b of the lower end of the support ring 26 is thicker than an interval between the convex portion 31a of the fastening ring 31 and the neck-shaped portion 12, and the support ring 6 cannot pass between the convex portion 31a of the fastening ring 31 and the neck-shaped portion 12. Therefore, a structure in which the support ring 26 is further firmly prevented from moving upward in the axial direction is implemented.

[0029] As described above, by the lock mechanism 40, the support ring 26 is not only pressed against the neck-shaped portion 12 by the fastening ring 31, but also prevented from moving in the axial direction, and is fixed to the neck-shaped portion 12.

[0030] On the other hand, any one part of the button 23, the piston 22, and the piston outer tube 22c is provided with engagement portions 28 that engage with the fastening ring 31 at a predetermined angle when the button 23, the piston 22, or the piston outer tube 22c is rotated about the axis thereof.

[0031] Here, an example in which the engagement portions 28 are provided at a lower end of an outer peripheral surface of the button 23 as shown in (a) of FIG. 4 will be described. The button 23 is attached to the piston 22 and the piston outer tube 22c to be rotatable about the axis, and the button 23 includes, as the engagement portions 28, first protrusions (hereinafter, referred to as first protrusions 28) protruding outward from the lower end of the outer peripheral surface of the button 23 (see (b) of FIG. 4).

[0032] As shown in FIG. 2, the fastening ring 26 has a height reaching an upper side of the opening 11 of the container 10. As shown in (a) and (b) of FIG. 5, second protrusions 29 each having a shape engageable with the first protrusion 28 are provided on the inner peripheral surface of the fastening ring 26 above the opening 11.

[0033] Therefore, when a user rotates the button 23 as shown in (a-1) and (a-2) of FIG. 6, makes the first protrusion 28 and the second protrusion 29 in an engagement state as shown in (b-1) and (b-2) of FIG. 6, and presses the button 23 in this state, the fastening ring 31 is extruded downward in the axial direction from between the support ring 26 and the fixing ring 32 (see (a-2) and (b-2) of FIG. 6).

[0034] Accordingly, as shown in FIG. 7, since the concave portion 31c of the fastening ring 31 gets over the fitting with the convex portion 26c of the support ring 26 and is displaced in the axial direction, a fitting state is eliminated. At the same time, since the pressing convex portion 31d at the same position as the concave portion 31c of the fastening ring 31 moves to a position of the concave portion 12b below the edge portion 12a of the neck-shaped portion 12, even when the pressing convex portion 31d is in contact with the fixing ring 32, there is no support ring 26 inside the position, so that the support ring 26 is released from a crimping force applied to the support ring 26 by the fixing ring 32. Accordingly, as shown in (c) of FIG. 6, the fixing ring 32 can be removed upward, and the support ring 26 can be removed from the neck-shaped portion 12 of the container 10.

[0035] Accordingly, the pump unit 20 after use can be removed from the container 10 and can be separated and discarded.

[0036] Since the removed pump unit 20 is still in a state of attaching the fastening ring 31 in a lowered state, even when the fixing ring 32 is covered, the support ring 26 cannot be crimped by the fastening ring 31, and the pump unit 20 cannot be fixed to the container 10 again. Accordingly, it is possible to prevent the contents in the container 10 from being replaced and the pump 20 from being fixed and reused again, and a quality of the contents in the spray container 1 can be guaranteed.

[0037] Here, the engagement portions 28 will be further described.

[0038] As shown in (b) of FIG. 4 and (a) of FIG. 5, the plurality of first protrusions 28 of the engagement portion are provided at regular intervals (here, every 90 degrees) in the peripheral direction of the outer peripheral surface of the button 23, and the second protrusions 29 are pro-

vided at positions corresponding to the first protrusions 28 on the inner peripheral surface of the fastening ring.

[0039] One of the first and second protrusions 28 and 29 (here, the second protrusion 29) includes a recess portion 29a in the peripheral direction and the other of the first and second protrusions 28 and 29 (here, the first protrusion 28) has a shape (here, a rhombus shape) of fitting into the recess portion 29a such that the first and second protrusions 28 and 29 can be engaged with each other.

[0040] Moreover, it is desirable that as shown in (a-1) and (b-1) of FIG. 6, in the first and second protrusions 28 and 29, when the button 23 is rotated, the first protrusions 28 are inserted and fitted into the recess portions 29a of the second protrusions 29 at a certain rotation angle, and when the button 23 is further rotated, the first protrusions 28 each have a shape of getting over and escaping the recess portions 29a of the second protrusions 29. Specifically, for example, it is desirable that a cross-sectional shape of the first protrusion 28 parallel to the outer peripheral surface of the button is a rhombus shape having a size that is able to be inserted into the recess portion 29a of the second protrusion 29. Accordingly, when the button 23 is rotated and the first protrusions 28 having a rhombus shape are moved in the peripheral direction, the first protrusions 28 can be easily inserted into the recess portions 29a regardless of a direction of rotation, and can easily escape from the recess portions 29a by further turning the button 23.

[0041] Accordingly, the first protrusions 28 and the second protrusions 29 are configured to change from a disengaged state to an engaged state and the disengaged state again as the button 23 rotates, so that even when the user rotates the button 23 to engage the first protrusions 28 and the second protrusions 29 during use, a use state can be easily restored by further rotating the button 23. Accordingly, the pump 20 can be prevented from being erroneously removed from the container 10 during use.

[0042] It is desirable that a bottom surface shape of the second protrusion 29 provided on the fastening ring 31 on a lower side in the axial direction is inclined with respect to the peripheral direction of the fastening ring 31. For example, it is desirable that as shown in (b) of FIG. 5 and (a-1) of FIG. 6, an outer shape of the second protrusion 29 in a cross section parallel to the inner peripheral surface of the fastening ring 31 is a rhombus shape in which the recess portion 29a is cut out on the upper surface.

[0043] With such a shape, when the pump unit 20 is attached to the neck-shaped portion 12 of the container 10 in manufacturing, and then the fastening ring 31 is pressfitted from above to the outside of the support ring 12, even if the second protrusion 29 is in a positional relationship in which the second protrusion 29 is pushed from just above the first protrusion 28 as shown in (a) to (c) of FIG. 8, the lower surface of the second protrusion 29 is inclined, so that the second protrusion 29 moves to escape in the peripheral direction such that the bottom surface of the second protrusion 29 slides on the upper surface of the first protrusion 28. Accordingly, it is possible to prevent a phenomenon that the first protrusion 28 or the second protrusion 29 is damaged during manufacturing. A yield can be improved.

[0044] A material of the fixing ring 32 is desirably a material that is not easily deformed, and is desirably metal or glass in addition to a resin. A material of the support ring 26 is desirably made of a resin or metal so as to be deformable. A material of the fastening ring 26 may be any material as long as the fastening ring can lock movement of the support ring 26 by engaging with the support ring 26 due to unevenness and can get over the unevenness and move by pressing down the button 23 to release the locking, and for example, a resin or metal can be used. As the resin of each component, polypropylene or polyethylene can be used.

[0045] Further, by providing a groove in the axial direction in the inner peripheral surface of the fixing ring 32, the fastening ring 31 can be smoothly pushed down in the axial direction.

[0046] Here, an operation of each part when the spray container 1 of the present embodiment is used and a series of operations when the pump unit 20 is removed after use will be described.

[0047] At the time of use, when the user presses down the button 23, the piston 22 is pushed down in a direction in which the springs 24a and 24b are compressed, and the tip end 22a of the piston 22 compresses the space 21a in the cylinder 21.

[0048] Thereafter, when the user releases his/her hand from the button 23, since the springs 24a and 24b extend and return to an original state, a space 21c of the cylinder 21 is depressurized, and the contents in the container 10 fill the space 21c in the cylinder 21 through the pipe 21d and the through hole 21b. The check valve 21c prevents the contents in the space 21c from flowing back and returning to the inside of the container 10.

[0049] When the user presses down the button 23 again, the piston 22 is pushed down in the direction in which the springs 24a and 24b are compressed, and when the space 21c filled with the contents is compressed, a pressure in the space 21c rises, the contents in the space 21a in the cylinder 21 pass through a gap between the cylinder 22 and the cylinder outer tube 22c, reach the button 23, and further pass through the flow path 23a in the button and are sprayed from a spraying port 25a.

[0050] When all the contents are sprayed and there is no content, the user separates and discards the spray container 1, so that the user removes the pump unit 20 from the container 10. Specifically, first, as shown in (a-1) and (a-2) of FIG. 6, the user rotates the button 23 to align the first protrusions 28 on the outer periphery of the button 23 with the recess portions 29a of the second protrusions 29 of the fastening ring 31 and fit the first protrusions 28 into the recess portions 29a ((b-1) and (b-2)

of FIG. 6).

[0051] In this state, when the user presses the button 23 downward, the fastening ring 31 is extruded downward and no crimping force is applied from the fixing ring 32 to the support ring 26, so that as shown in (c) of FIG. 6, the fixing ring 32 can be removed upward. After removing the fixing ring 32 upward, the user removes the pump unit 20 from the container 10 with the fastening ring 31 attached.

[0052] As described above, even when the material of the container 10 and the material of the pump unit are different, the container and the pump unit can be separated and discarded.

[0053] For separation, an operation of pressing down the button 23 requires a larger force than a force of pressing the button 23 at the time of use, but the button 23 is originally designed to be pressed down, and a user's force can be efficiently transmitted to the fastening ring 31. Since the fastening ring 31 is pushed down while maintaining the shape, the fastening ring 31 can be pushed down with a force smaller than when the fastening ring 31 is broken, and the pump unit 20 can be removed.

[0054] As described above, the present embodiment can provide the spray container 1 capable of removing and separating the pump unit 20 from the container 10 with a small force after the contents are used.

[0055] In the above-described embodiment, as the lock mechanism 40, the structure in which the ring-shaped convex portion 26c is provided in the support ring 26, the ring-shaped concave portion 31c is provided in the fastening ring 31, and the fastening ring 31 gets over the unevenness and is pushed down by pressing down the button 23 to release the locking has been described, but the invention is not limited to such a lock mechanism 40. Any structure may be used as long as the locking can be released in the mechanism by pressing down the button 23. For example, the fastening ring 31 may have a structure such as a pin instead of an annular shape, and may be configured to be locked by being engaged with the support ring 26. Also, in this case, by adopting a structure in which the engagement between the pin and the support ring 26 is released as the button 23 is pressed down, it is possible to implement a mechanism in which the locking is released by pressing down the button 23 and the pump unit 20 can be removed.

Reference Signs List

[0056] 1 spray container, 10 container, 11 opening, 12 neck-shaped portion, 20 pump unit, 21 cylinder, 22 piston, 22c piston outer tube, 23 button, 23a flow path, 24a, 24b spring, 25 spraying port, 26 support ring, 27 packing, 28 engagement portion (first protrusion), 29 second protrusion, 30 fixing tool, 31 fastening ring, 32 fixing ring

Claims

1. A spray container, comprising:

   a container that includes a neck-shaped portion around an opening;
   a pump unit that sprays contents in the container; and
   a fixing tool that fixes the pump unit to the neck-shaped portion, wherein
   the pump unit includes a cylinder having one portion inserted into the opening, a piston having one end inserted into the cylinder, a button attached to another end of the piston and pushing the piston into the cylinder, and a support ring disposed to cover at least a part of an outer periphery of the neck-shaped portion of the opening and supporting the cylinder at an edge portion of the opening,
   the fixing tool includes a fastening ring disposed such that an inner peripheral surface thereof is in contact with an outer peripheral surface of the support ring, and a fixing ring disposed to be in contact with an outer peripheral surface of the fastening ring,
   the fastening ring and the fixing ring include a lock mechanism for fixing the support ring to the neck-shaped portion,
   a part of the button or the piston is provided with an engagement portion that engages with the fastening ring at a predetermined angle when the button or the piston is rotated about an axis thereof, and
   the lock mechanism has a structure in which locking is released when the button is pressed in a state where the part of the button or the piston is engaged with the fastening ring by the engagement portion, and the pump unit is able to be removed from the neck-shaped portion of the container.

2. The spray container according to claim 1, wherein the lock mechanism has a structure in which when the button is pressed in a state where the part of the button or the piston is engaged with the fastening ring by the engagement portion, the pump unit is able to be removed from the neck-shaped portion of the container by the fastening ring being extruded in an axial direction from between the support ring and the fixing ring.

3. The spray container according to claim 1 or 2, wherein
   the support ring is provided with one or more notches in an axial direction.

4. The spray container according to any one of claims 1 to 3, wherein

the button is attached to the piston to be rotatable about an axis,
the button includes, as the engagement portion, a first protrusion that protrudes outward from an outer peripheral surface of the button, and
the fastening ring extends above the opening of the container, and a second protrusion engageable with the first protrusion is provided on the inner peripheral surface of the fastening ring located above the opening.

5. The spray container according to claim 4, wherein

a plurality of the first protrusions are provided at regular intervals in a peripheral direction of the outer peripheral surface of the button, and
the second protrusions are provided at positions corresponding to the first protrusions on the inner peripheral surface of the fastening ring.

6. The spray container according to claim 4 or 5, wherein one of the first and second protrusions includes a recess portion in the peripheral direction, and the other one has a shape of fitting into the recess portion.

7. The spray container according to claim 6, wherein when the button is rotated, the other one of the first and second protrusions is inserted into the recess portion of the one of the first and second protrusions at a certain rotation angle, and when the button is further rotated, the other one of the first and second protrusions has a shape of escaping from the recess portion of the one of the first and second protrusions.

8. The spray container according to claim 6, wherein a bottom surface shape of the second protrusion provided on the fastening ring on a lower side in an axial direction is inclined with respect to a peripheral direction of the fastening ring.

9. The spray container according to claim 8, wherein an outer shape of the second protrusion in a cross section parallel to the inner peripheral surface of the fastening ring is a rhombus shape, which is a shape in which the recess portion is cut out on an upper surface thereof.

10. The spray container according to claim 8, wherein a cross-sectional shape of the first protrusion parallel to the outer peripheral surface of the button is a rhombus shape having a size that is able to be inserted into the recess portion of the second protrusion.

11. The spray container according to any one of claims 1 to 10, wherein

the lock mechanism includes a convex portion or a concave portion provided on the outer peripheral surface of the support ring and a concave portion or a convex portion provided on the inner peripheral surface of the fastening ring at a position corresponding to the convex portion or the concave portion, and when the convex portion or the concave portion of the support ring engages with the concave portion or the convex portion on the inner peripheral surface of the fastening ring, the lock mechanism is in a locked state, and
when the button is pressed in a state where the button or the piston is engaged with the fastening ring by the engagement portion, the fastening ring gets over the convex portion or the concave portion of the support ring and is pushed downward in an axial direction, and the locked state is released.

12. The spray container according to claim 11, wherein the convex portion or the concave portion of the support ring and the concave portion or the convex portion of the fastening ring are provided in a ring shape along a peripheral direction of the outer peripheral surface of the support ring and the inner peripheral surface of the fastening ring.

13. The spray container according to claim 11 or 12, wherein
a pressing convex portion is further provided on the outer peripheral surface of the fastening ring, and when the fastening convex portion is in contact with the fixing ring, the fastening ring is pressed against the support ring.

14. A content spraying unit, comprising:

a pump unit that sprays contents in a container including a neck-shaped portion around an opening; and
a fixing tool that fixes the pump unit to the neck-shaped portion, wherein
the pump unit includes a cylinder having one portion inserted into the opening, a piston having one end inserted into the cylinder, a button attached to the other end of the piston and pushing the piston into the cylinder, and a support ring disposed to cover at least a part of an outer periphery of the neck-shaped portion of the opening and supporting the cylinder at an edge portion of the opening,
the fixing tool includes a fastening ring disposed such that an inner peripheral surface thereof is in contact with an outer peripheral surface of the support ring, and a fixing ring disposed to be in contact with an outer peripheral surface of the fastening ring,
the fastening ring and the fixing ring include a

lock mechanism for fixing the support ring to the neck-shaped portion,
a part of the button or the piston is provided with an engagement portion that engages with the fastening ring at a predetermined angle when the button or the piston is rotated about an axis thereof, and
the lock mechanism has a structure in which locking is released when the button is pressed in a state where the part of the button or the piston is engaged with the fastening ring by the engagement portion, and the pump unit is able to be removed from the neck-shaped portion of the container.

FIG. 1

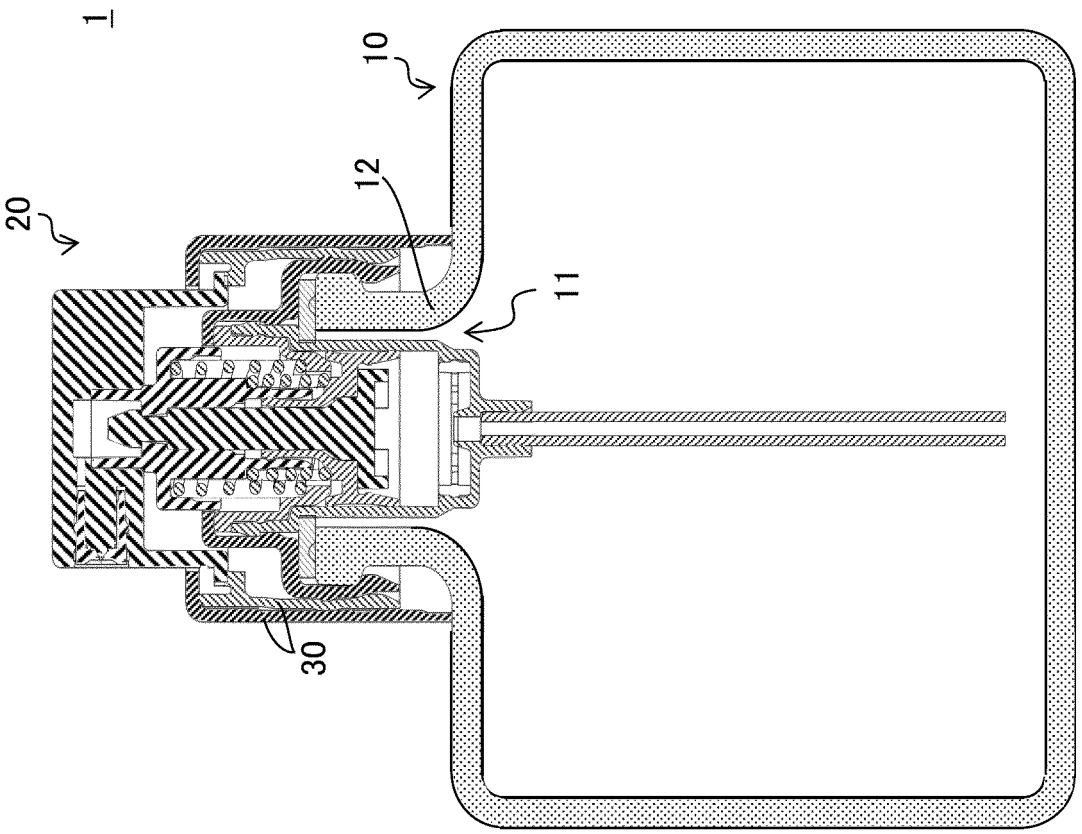
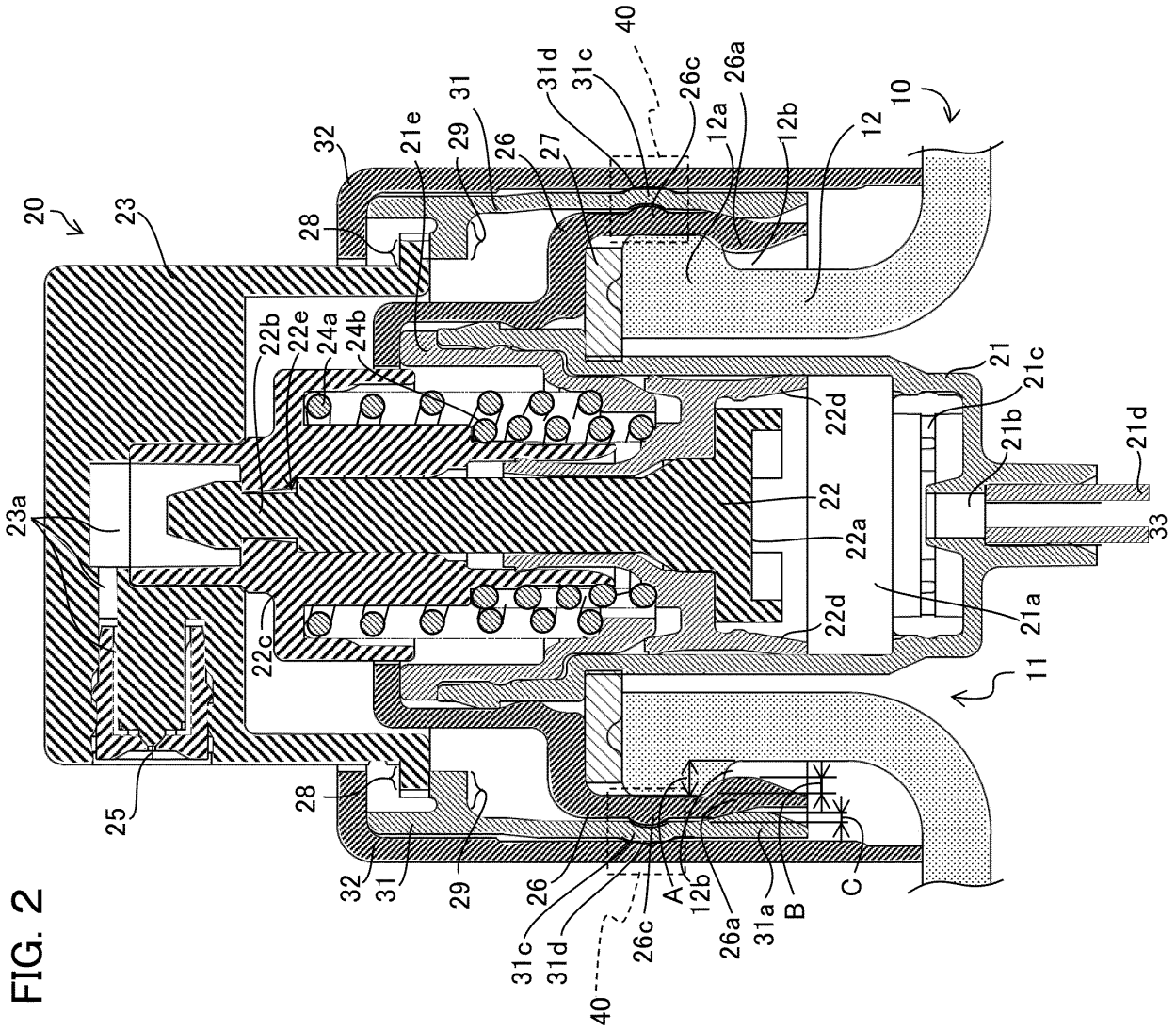


FIG. 2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21e
29
31
26
27
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31c
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26c
26a
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12
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22e
24a
24b
21
21c
22d
21b
21d
23a
22
22a
33
22c
21a
11
25
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26
31c
31d
40
26c
A
12b
26a
31a
B
C

FIG. 3

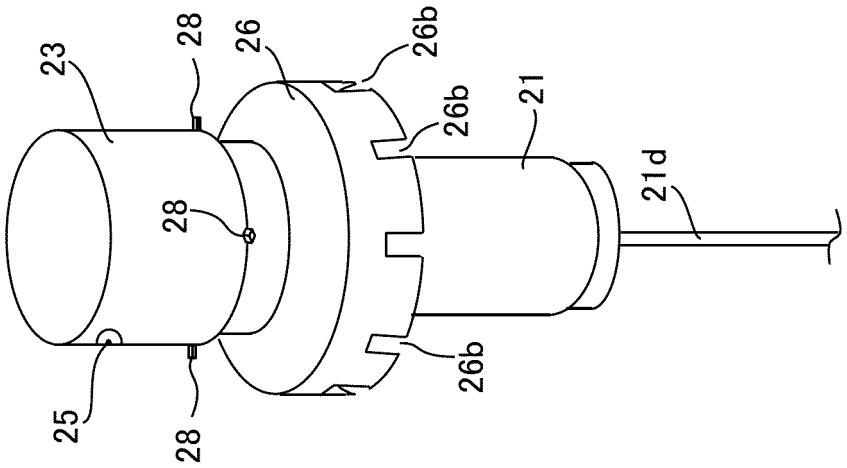


FIG. 4

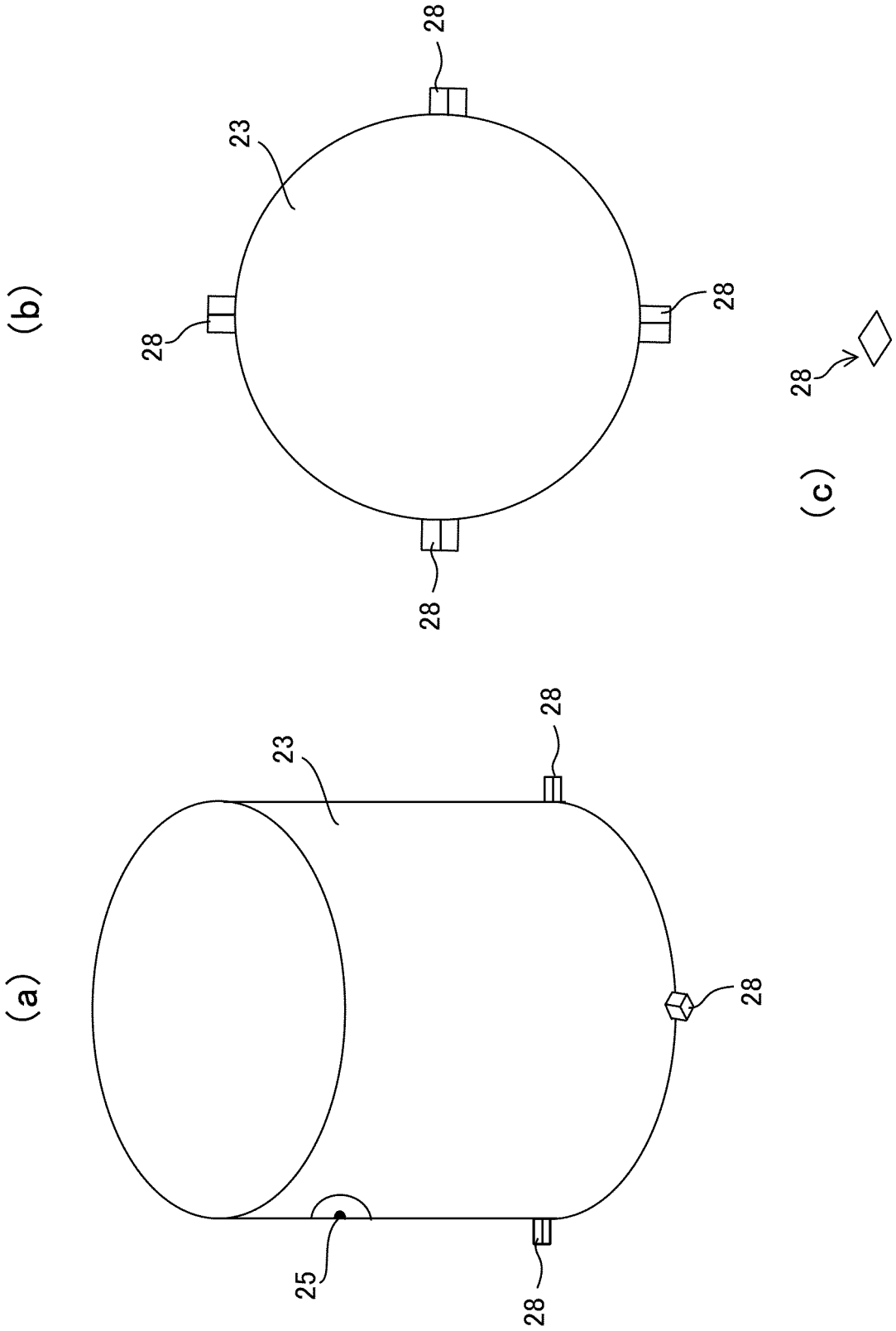


FIG. 5

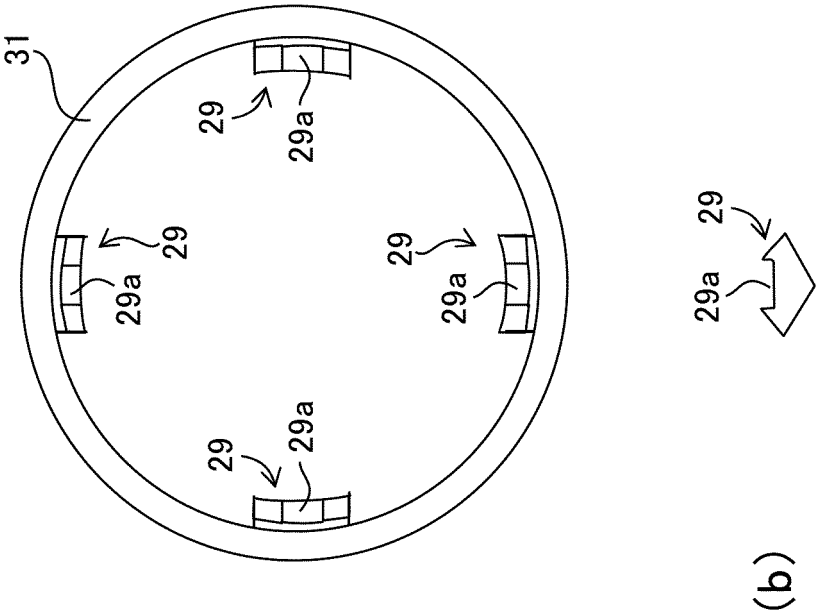
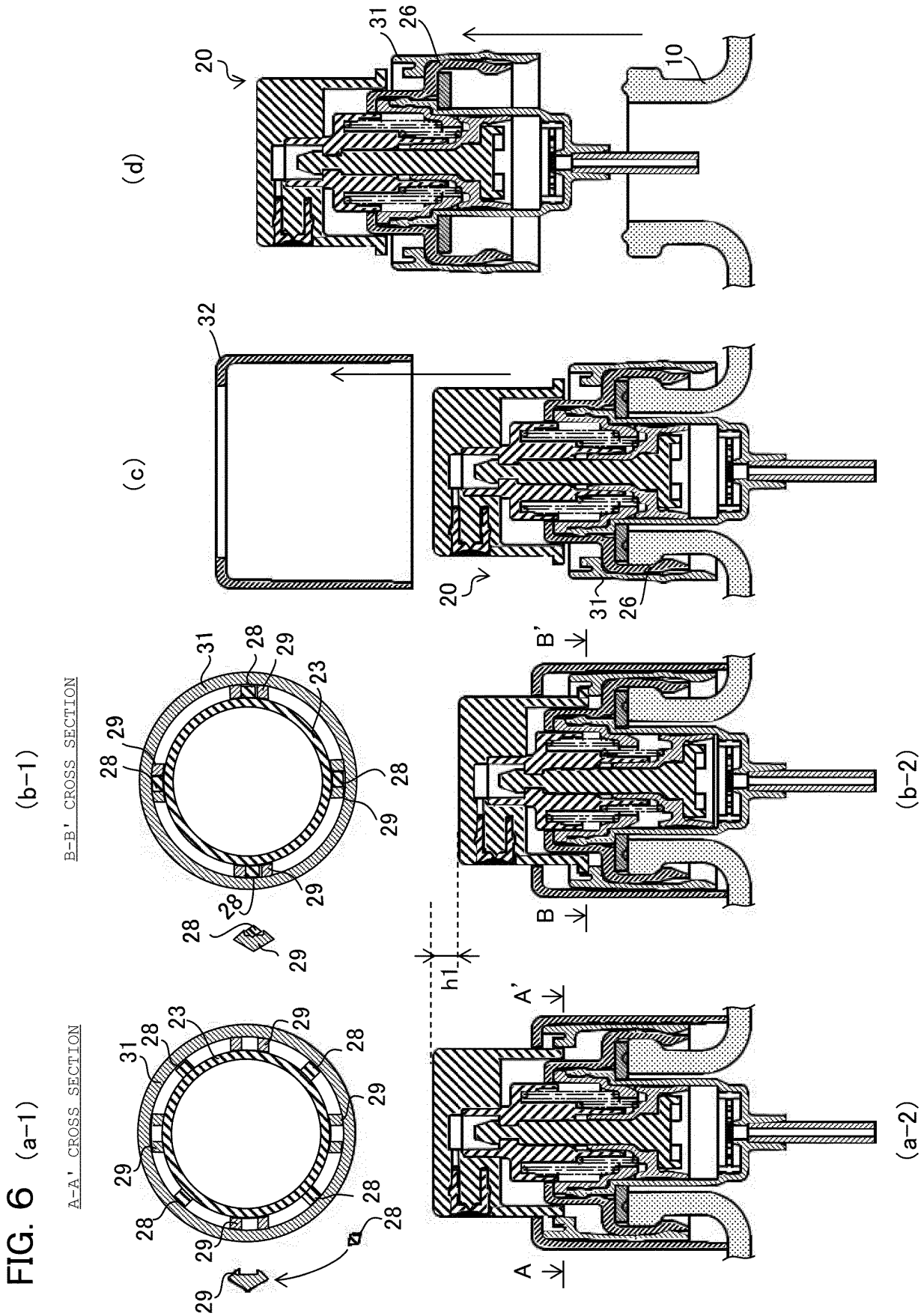


FIG. 6


(a-1)
A-A' CROSS SECTION
(b-1)
B-B' CROSS SECTION
(a-2)
(b-2)
(c)
(d)
A
A'
B
B'
h1
10
20
23
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29
31
32

FIG. 7

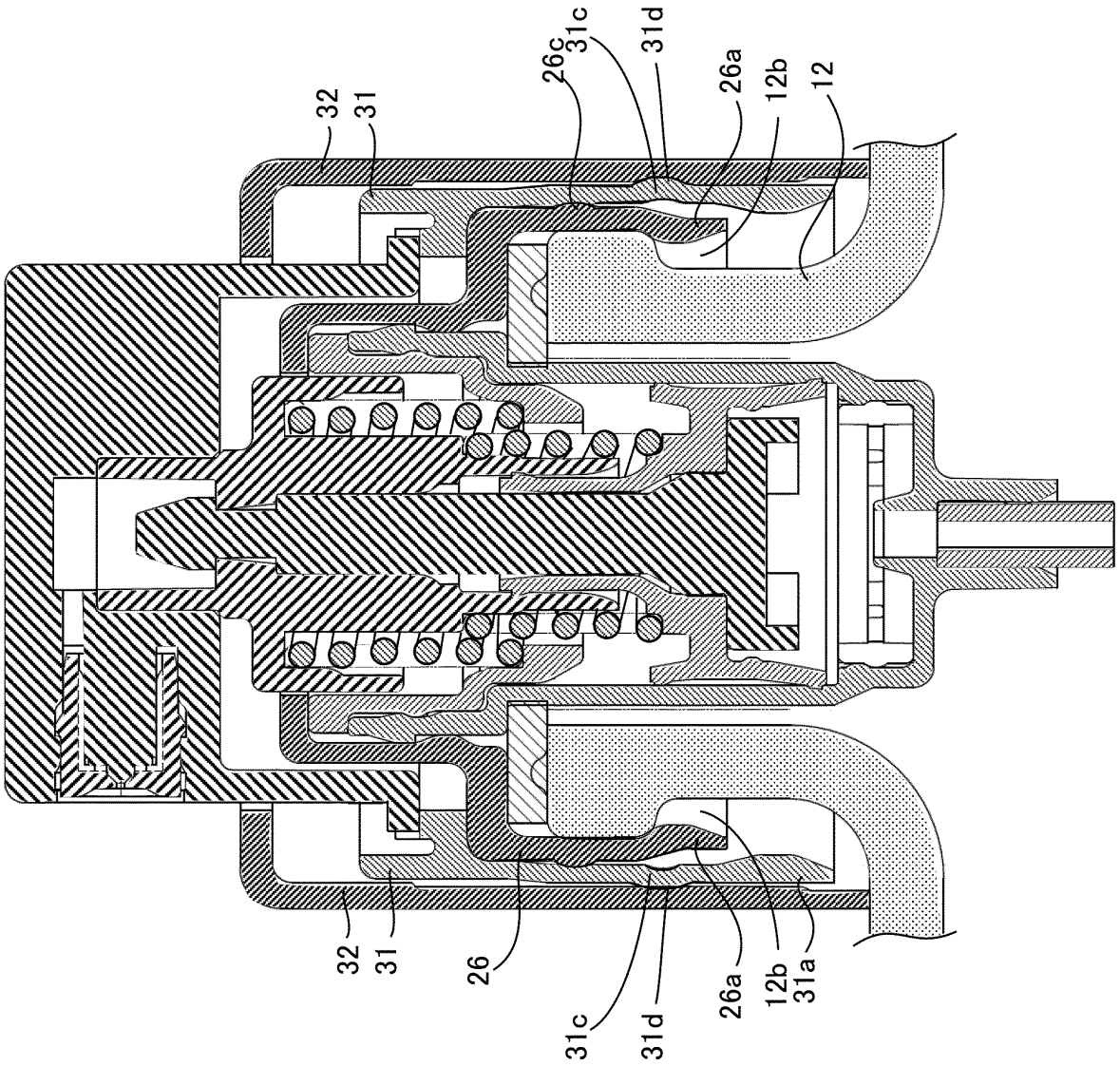
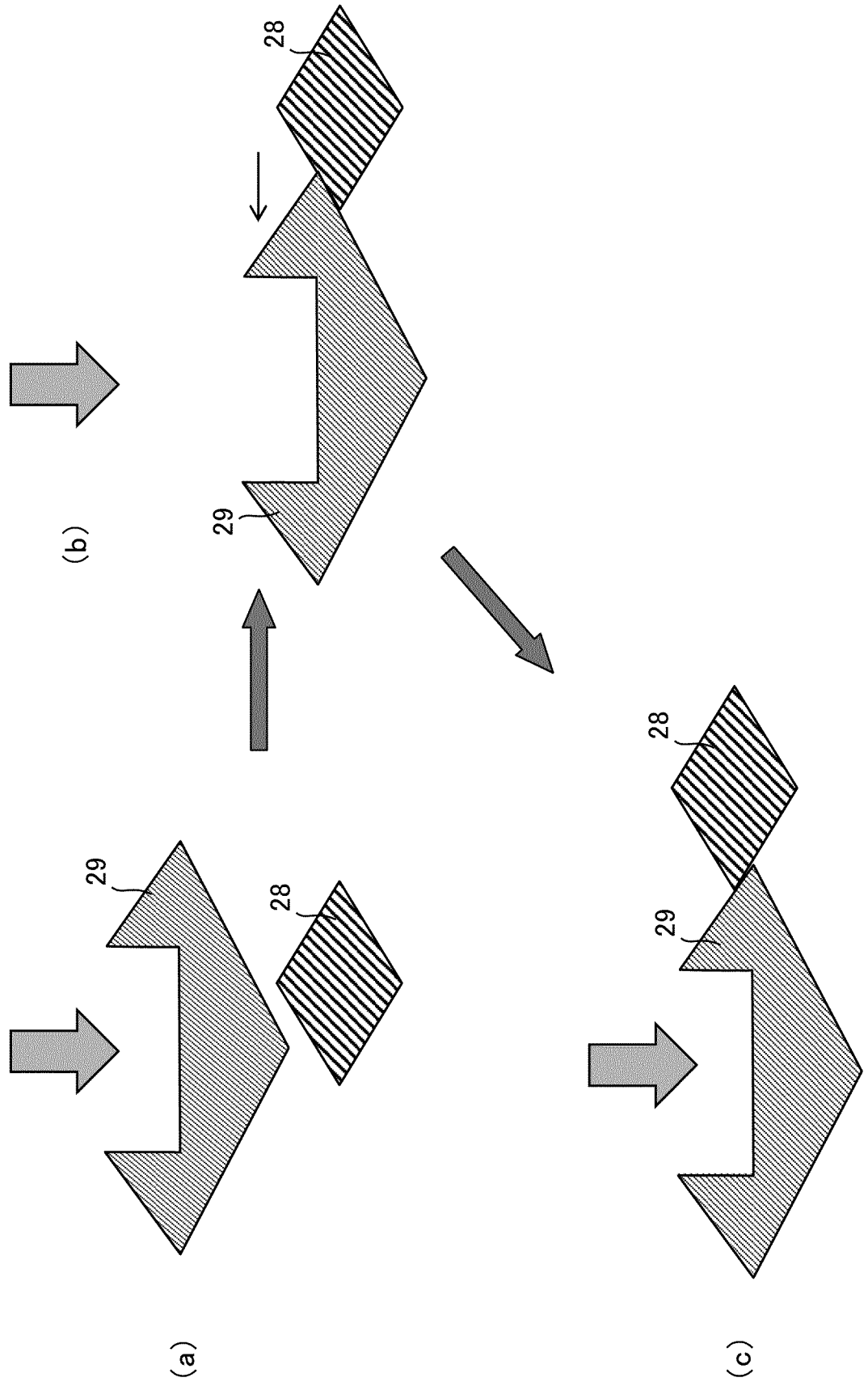


FIG. 8



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2020/041770

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl. B05B11/00(2006.01)i, B65D83/00(2006.01)i
FI: B65D83/00K, B05B11/00101E

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)
Int.Cl. B05B11/00, B65D83/00

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

Published examined utility model applications of Japan	1922-1996
Published unexamined utility model applications of Japan	1971-2021
Registered utility model specifications of Japan	1996-2021
Published registered utility model applications of Japan	1994-2021

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.
A	JP 2015-78009 A (DAIZO KK) 23 April 2015 (2015-04-23)	1-14
A	JP 2003-20085 A (MITANI VALVE CO., LTD.) 21 January 2003 (2003-01-21)	1-14
A	JP 2004-203443 A (MASUDA, Katsutoshi) 22 July 2004 (2004-07-22)	1-14
A	JP 2000-255608 A (TAKEUCHI PRESS IND CO., LTD.) 19 September 2000 (2000-09-19)	1-14
A	US 6708846 B1 (ING. ERICH PFEIFFER GMBH) 23 March 2004 (2004-03-23)	1-14

☐ 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
08 January 2021	26 January 2021

Name and mailing address of the ISA/	Authorized officer
Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Telephone No.

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2020/041770

JP 2015-78009 A	23 April 2015	(Family: none)
JP 2003-20085 A	21 January 2003	(Family: none)
JP 2004-203443 A	22 July 2004	US 2004/0124212 A1 EP 1433534 A2 KR 10-0603503 B1 CN 1511763 A CN 101104464 A
JP 2000-255608 A	19 September 2000	(Family: none)
US 6708846 B1	23 March 2004	WO 2000/047332 A1 DE 19905993 A1 DE 29908923 U1

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2012511480 A **[0005]**