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(54) SPOUT, SPOUT AND CAP ASSEMBLY, AND PACKAGING BAG WITH SPOUT

(57) A spout (14) is put between and attached to a pair of plane parts (20A and 20B) comprising front and rear surfaces forming a bag body (12). The spout (14) comprises: a tube part (30) to which a cap (16) having a tamper-proof ring 24 is attached on its topside; and a first flange (32A) and a second flange (32B) provided on an outer peripheral surface of the tube part (30) on the side of its base end. The outer diameter (A_D) of the first flange (32A), which is the topmost, is equal to or larger than the outer diameter (C_D) of the tamper-proof ring (24) in a front-rear direction of the bag body (12). This causes the first flange (32A) to cover the whole lower part of the the tamper-proof ring (24).

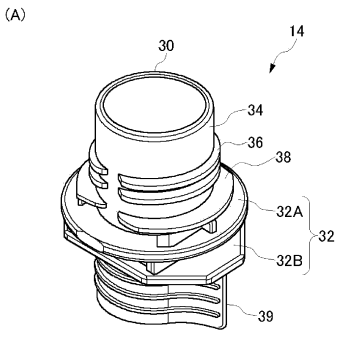

FIG. 2

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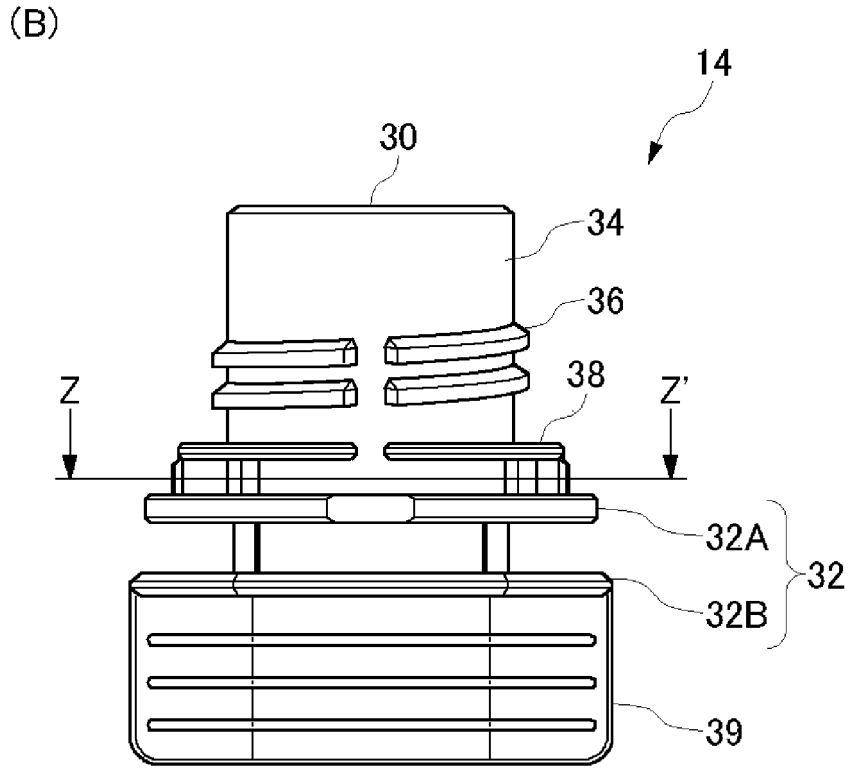


FIG. 2

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of Japanese Patent Application No. 2021-117121 filed on July 15, 2021 in Japan, the contents of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to a spout, a spout and cap assembly, and a spouted pouch.

BACKGROUND ART

[0003] Spouted pouches in which a spout provided with a reclosable cap is attached to a flexible pouch of plastic film or the like are widespread for the purpose of containing liquid beverages or the like. This has caused the development of combinations of a cap and a spout with a tamper-proof function to prevent a cap from being opened fraudulently.

[0004] An example of a spout and a cap having a tamper-proof function is a configuration in which there is a circular member along the lower part of a cap body. In an example of such a configuration, a connection between the cap body and the circular member is cut off after opening of the cap and the circular member is left as it is on the spout, which allows consumers to recognize the opening (Patent document 1: Japanese Patent Laid-Open Application No. 2015-168478).

[0005] The circular member according to Patent document 1, or a pilfer-proof band, is left on a mouthpiece part of the spout with the band remaining circular after the disconnection of the band from the cap body when the cap is opened. There on the band may remain a small prickle or the like resulted from the disconnection from the cap body. Consequently, a consumer putting the spout into the mouth would lead to the prickle or the like on the band touching the mouth and bringing the consumer a feeling of discomfort.

[0006] Some spouts have a flange part comprising two or more tires of flanges in order to facilitate handling of spouted pouches when they are manufactured or are filled inside with the contents. When opening a spouted pouch provided with such a spout, a consumer often opens it by gripping with one hand the flange part or a welded part between the pouch and the spout which is nearer its base end (nearer the pouch) than the flange part, and gripping and turning with the other hand a cap attached to the spout.

[0007] When a consumer holds a flange part with a hand to open a spouted pouch, the flange part sometimes digs into fingers of the consumer and causes pain or a feeling of discomfort to the consumer. In order to control such pain and a feeling of discomfort caused to the consumer, the spout according to Patent document 1 is formed with a hollow recess on a flange part to be gripped by a consumer toward a tube part of the spout.

[0008] On the other hand, Patent document 2 (Japanese Patent Laid-Open Application No. 2004-331124) describes a plug part where opening is recognized by a tamper-proof ring, which is a circular member, being circumferentially cut into two or more pieces with a connection between a cap body and the tamper-proof ring partially maintained.

SUMMARY OF THE INVENTION

Problems to be solved by the invention

[0009] As shown in Figure 8, when a consumer opens a cap 100 of a spouted pouch using the plug part of Patent document 2, a cut piece of a tamper-proof ring 104 connected to a cap body 102 widely spreads and turns obliquely downward. This might bring the consumer a feeling of discomfort when the cap 100 is reattached to the spouted pouch, since an end 106 of the cut piece touches the consumer's fingers gripping the pouch, or the like.

[0010] A purpose of the disclosure made in view of the above is to provide a spout, a spout and cap assembly, and a spouted pouch that do not bring the fingers and mouth of a consumer gripping the spouted pouch a feeling of discomfort due to an end, a prickle, or the like of a tamper-proof ring cut by opening of a cap.

Means for solving the problems

[0011] A spout of an aspect of the disclosure is put between and attached to a pair of plane parts comprising front and rear surfaces forming a bag body, and the spout comprises: a hollow and tubular tube part; and a flange part comprising a plurality of flanges provided on an outer peripheral surface of the tube part on a side of a base end thereof, where a cap having a cap body and a tamper-proof ring connected to the cap body is attached to the tube part on a topside thereof, where the tamper-proof ring circumferentially splits into a plurality of pieces with the connection to the cap body partially maintained, and where a top flange which is the topmost flange of the plurality of flanges is equal to or larger than the tamper-proof ring in outer diameter in a front-rear direction of the bag body.

[0012] This configuration causes the top flange to be put between the tamper-proof ring and fingers if a consumer puts the thumb under the top flange to grip the spouted pouch when opening the cap. In other words, the top flange is positioned below the tamper-proof ring so as to cover the fingers. Therefore, after opening of the cap, an end, a prickle, or the like of a cut piece of the tamper-proof ring that has split circumferentially into a plurality of pieces with the connection to the cap body partially maintained and has turned obliquely downward does not touch the fingers and mouth of the consumer. As a result, the spouted pouch using the spout of the

present configuration does not bring a consumer gripping the spouted pouch a feeling of discomfort due to an end of the cut tamper-proof ring.

[0013] The top flange being equal to or larger than the tamper-proof ring in outer diameter causes the top flange to cover the whole lower part of the tamper-proof ring. This can prevent the tamper-proof ring from being tampered from below.

[0014] In the spout described above, the top flange may have two straight sections parallel to the pair of plane parts. When two or more spouted pouches are arranged in the front-rear direction of the bag body for filling of the contents or the like, the present configuration causes adjacent spouted pouches to come into contact with one another at the straight sections of their top flanges. The adjacent spouted pouches therefore have their surfaces in contact, so that the spouted pouches can be prevented from being misaligned due to overlapping of flange parts of adjacent spouted pouches when the spouted pouches are arranged and carried.

[0015] In the spout described above, a base-end flange nearer the base end than the top flange may be shorter than the top flange in length in the front-rear direction of the bag body. The spouted pouch using the spout of this configuration leads a consumer to grip the base-end flange rather than the top flange. Therefore, it can more reliably prevent fingers or the like of a consumer gripping the spouted pouch from touching the tamper-proof ring.

[0016] In the spout described above, the base-end flange nearer the base end than the top flange may be formed with a hollow in a direction parallel to the pair of plane parts. This configuration allows a consumer to avoid pain and a feeling of discomfort in fingers caused by gripping the base-end flange.

[0017] In the spout described above, the flange part having the plurality of flanges may comprise the two flanges, namely, the top flange and the base-end flange nearer the base end than the top flange. This configuration does not bring a consumer gripping the spouted pouch a feeling of discomfort due to an end of the cut tamper-proof ring even if the number of the flanges is two.

[0018] A spout and cap assembly of an aspect of the disclosure comprises: the spout described above; and a cap having a cap body and a tamper-proof ring connected to the cap body, the cap being attached to a tube part of the spout on a topside thereof.

[0019] A spouted pouch of an aspect of the disclosure, in relation to the spout described above, comprises: a bag body formed of a pair of plane parts comprising front and rear surfaces; the spout described above put between and attached to the pair of plane parts; and a cap having a cap body and a tamper-proof ring connected to the cap body, the cap being attached to a tube part of the spout on a topside thereof. This configuration can prevent fingers or the like of a consumer gripping the spouted pouch from touching the tamper-proof ring.

Advantage of the invention

[0020] The present disclosure avoids bringing fingers and mouth of a consumer gripping a spouted pouch a feeling of discomfort due to an end, a prickle, or the like of a tamper-proof ring cut by opening of a cap.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021]

Figure 1 is a top perspective view of a spouted pouch of an embodiment;
Figure 2 is an external view of a spout of the embodiment, where (A) is a top perspective view and (B) is a front view;
Figure 3 is a transverse sectional view of the spout of the embodiment cut along a line Z-Z' in Figure 2 (B);
Figure 4 is an external view of a cap, where (A) is a side view and (B) shows a positional relation between lugs of a tamper-proof ring and ratchets;
Figure 5 shows a size relation between a first flange and the tamper-proof ring;
Figure 6 shows a state in which spouted pouches are arranged in a holder;
Figure 7 is a transverse sectional view above a first flange of a spout of another embodiment; and
Figure 8 shows the state of a tamper-proof ring after opening of a spouted pouch.

MODES OF EMBODYING THE INVENTION

[0022] An embodiment of the disclosure will now be described with reference to the drawings. The embodiment described below is merely illustrative of ways to implement the disclosure, and does not limit the disclosure to the specific configurations described below. When the disclosure is to be implemented, any specific configuration may be appropriately adopted according to the mode of implementation.

[0023] Figure 1 is a top perspective view of a spouted pouch 10 of the embodiment. The spouted pouch 10 of the embodiment comprises a bag body 12 forming a pouch, a spout 14, and a cap 16.

[0024] The bag body 12 has a pair of plane parts 20A and 20B comprising front and rear surfaces, and the spout 14 is put between and attached to the pair of plane parts 20A and 20B. Specifically, the spouted pouch 10 is formed in such a way that the spout 14 is heat-sealed on the inside of films constituting the pair of plane parts 20A and 20B of the bag body 12 with a attachment part 39 provided on the lower part of the spout 14 (see Figure 2) being put between them. The bag body 12 of the embodiment has a pair of side parts other than the plane parts 20A and 20B, but is not limited to this.

[0025] A cap 16 having a cap body 22 and a tamper-proof ring 24 is attached to the topside of a tube part 30

of the spout 14 of the embodiment.

[0026] The configuration of the spout 14 of the embodiment will be described with reference to Figures 2 and 3. Figure 2 (A) is a top perspective view of the spout 14, Figure 2 (B) is a front view of the spout 14, and Figure 3 is a transverse sectional view of the spout 14 (cut along a line Z-Z' in Figure 2 (B)). Note that a direction of a line connecting the topside and the base-end side of the spout 14 in Figure 2 is referred to as the vertical direction.

[0027] The spout 14 comprises the tube part 30 to which the cap 16 is attached on the topside, and a flange part 32 comprising a plurality of flanges provided on an outer peripheral surface of the tube part 30 on the base-end side.

[0028] The tube part 30 is hollow and tubular and has a mouthpiece part 34 on the top, and a male thread 36 for screwing into the cap 16 is formed on the outer peripheral surface of the lower part of the mouthpiece part 34. This allows the cap 16 to be removably attached to the spout 14.

[0029] As to the flange part 32, two or more tiers of flanges are provided on the outer peripheral surface of the tube part 30 on the base-end side, extending horizontally with respect to the vertical direction. The flange part 32 is used as a part to be gripped with a hand when the contents are discharged from the spouted pouch 10. Alternatively, the flange part 32 is used as a part to be put on a holder or the like in order for spouted pouches 10 to be arranged in a line when they are manufactured or are filled inside with the contents.

[0030] The spout 14 of the embodiment has the flange part 32 that comprises two tiers of flanges, namely, a first flange 32A and a second flange 32B. The first flange 32A is a top flange on the topside of the tube part 30. The second flange 32B is a base-end flange nearer the base end than the first flange 32A. The upper surface of the first flange 32A on the top tier comes in contact with the undersurface of the cap 16, that is, the undersurface of the tamper-proof ring 24. The undersurface of the second flange 32B on the bottom tier comes in contact with the upper edges of the bag body 12, so as to prevent the spout 14 from falling into the inside of the bag body 12 in a manufacturing process. The first flanges 32A and the second flange 32B of the embodiment will be described in detail later.

[0031] The spout 14 of the embodiment has a stopper 38 extending horizontally above the first flange 32A. The stopper 38 has a structure in which a pair of fan-shaped flanges are arranged on the left and right sides of the mouthpiece part 34, and the outer edges of the stopper 38 are formed to be positioned inside the outer edge of the first flange 32A on the top tier.

[0032] The stopper 38 is positioned a predetermined distance above the first flange 32A, and a gap is formed between the stopper 38 and the first flange 32A. Ribs 40, 42, and 44 are formed in this gap so as to connect the first flange 32A to the stopper 38. The ribs 40, 42, and 44 are provided in pairs, where ribs of each pair are in point-symmetric positions.

[0033] The ribs 40 are arranged to extend from the outer peripheral surface of the mouthpiece part 34 toward the left and right sides, respectively. The tip end of each rib 40 is a rachet 41 protruding outside the outer edge of the stopper 38. The rachets 41 are provided so as to be able to engage with tapered and almost trapezoidal lugs 66 (see Figure 4 (B)) formed on the inner peripheral surface of ring pieces 64 constituting the tamper-proof ring 24.

[0034] Each rib 42 extends perpendicularly to each rib 40 from a position between the base and the tip end of each rib 40 to the rim of the stopper 38. The tip end of each rib 42 is a rachet 43 protruding outside the outer edge of the stopper 38. The rachets 43 are provided so as to be able to engage with tapered and almost trapezoidal lugs 68 (see Figure 4 (B)) formed on the inner peripheral surface of the ring pieces 64 constituting the tamper-proof ring 24.

[0035] The ribs 44 are formed to be symmetric with respect to the mouthpiece part 34. The ribs 44 function to prevent the tamper-proof ring 24 from being deformed inside at initial opening and to prevent the stopper 38 from being deformed.

[0036] The pair of rachets 41 and the pair of rachets 43 are formed in almost trapezoidal shapes with the cross sections tapering down toward their tip ends, protrude outside the outer edge of the stopper 38, are each arranged in symmetric positions with respect to the mouthpiece part 34 as a central axis, and are shaped to be slightly slanted toward the opposite side of an opening direction X of the cap 16. The above-described shapes of the rachets 41 and 43 allow the lugs 66 and 68 on the inner peripheral surface of the tamper-proof ring 24 to go beyond the rachets 41 and 43 when the cap 16 is turned in a closing direction Y. The lugs 66 and 68 and the rachets 41 and 43 then engage when the cap 16 is turned in the opening direction X.

[0037] When the cap 16 is screwed onto the mouthpiece part 34 so as to be closed, the rachets 41 and 43 in this configuration come in contact with the lugs 66 and 68 on the inner peripheral surface of the tamper-proof ring 24 short of the lowest position where the cap 16 can be screwed. Continuing to turn the cap 16 in the closing direction Y causes the lugs 66 and 68 to go beyond the rachets 41 and 43, and the closing of the mouthpiece part 34 is complete.

[0038] On the other hand, when the cap 16 is turned in the opening direction X after the completion of the closing of the mouthpiece part 34 with the cap 16, the lugs 66 and 68 of the tamper-proof ring 24 and the rachets 41 and 43 engage right after the start of the turning in the opening direction X. Then, resistance occurs against the turning of the cap 16 in the opening direction X, but continuing the turning in the opening direction X results in cutting of later-described easy-to-cut connecting pieces 60 connecting the cap body 22 to the tamper-proof ring 24 and easy-to-cut sections 58 of the tamper-proof ring

24. That is, the turning of the cap 16 in the opening direction X cannot be continued unless the easy-to-cut connecting pieces 60 and the easy-to-cut sections 58 are cut.

[0039] The spout 14 has on its base end the attachment part 39 to be attached to the upper end of the bag body 12. The attachment part 39 is formed to extend toward the left and right sides, and its outer surface is attached with the upper edges of the pair of plane parts 20A and 20B forming the bag body 12.

[0040] The spout 14 is formed of, for example, a synthetic resin. Synthetic resins for forming the spout 14 include, for example, polyolefin resins, polyamide resins, polyester resins, (meth) acryl resins, vinyl chloride resins, and ethylene-vinylalcohol copolymers. In particular, polyolefin resins are preferable because of their superior workability and cost performance.

[0041] Polyolefin resins include, for example, polyethylene-based resins such as high-density polyethylene, medium-density polyethylene, high-pressure low-density polyethylene, linear low-density polyethylene, and ethylene-vinyl acetate copolymers, olefinic elastomers such as ethylene-α-olefin copolymers, polypropylene-based resins such as polypropylene, ethylene-propylene random copolymers, and α-olefin propylene random copolymers, and cyclic polyolefin resins. These resins may be blended for performance improvement, or may be partially cross-linked for the purpose of improving the heat resistance or the like.

[0042] Note that the spout 14 may be formed of a single material, or a multi-layer structure comprising various resin layers may be formed. It is preferable to form the attachment part 39 constituting the spout 14 of the same kind of resin as the one forming the innermost layers of the plane parts 20A and 20B in order to allow the attachment part 39 to be heat-sealed with the bag body 12.

[0043] The cap 16 removably attached to the mouthpiece part 34 of the spout 14 will be described next with reference to Figure 4. Figure 4 (A) is a side view of the cap 16, and Figure 4 (B) shows a positional relation between the lugs 66 and 68 of the tamper-proof ring 24 and the ratchets 41 and 43.

[0044] The cap 16 of the embodiment comprises the cap body 22 and the tamper-proof ring 24.

[0045] The cap body 22 is formed tubular, and comprises a disc-like top part 50 covering and sealing the top and a skirt part 52 forming the side. The lower part of the skirt part 52 is made to be a tapered-shape part 52a spreading out downward. A spiral female thread 54 is formed on the inner peripheral surface of the cap body 22. The female thread 54 screws onto the male thread 36 formed on the outer peripheral surface of the mouthpiece part 34 of the spout 14 so as to be reclosable. A fluted knurling 52b is formed on the outer peripheral surface of the cap body 22 for slip resistance.

[0046] A doughnut-shaped circular protrusion 56 may be provided on the inner surface of the disc-like top part 50. When the cap 16 is screwed onto the the mouthpiece part 34, the circular protrusion 56 fits inside the mouthpiece part 34 to function as a gasket and ensure sealing performance.

[0047] The tamper-proof ring 24 is circular, is connected to the lower end of the skirt part 52 of the cap body 22 and positioned under the cap body 22, and is provided so as to extend in a circumferential direction of the cap 16 around almost the same diameter as the lower end of the tapered-shape part 52a. When the cap 16 is opened, the connection of the tamper-proof ring 24 to the cap body 22 is partially cut, and the tamper-proof ring 24 is split into the two or more ring pieces 64 with the connection to the cap body 22 partially maintained. Whether the cap 16 has been opened or not can be determined based on whether the tamper-proof ring 24 is split into a plurality of pieces and its connection to the cap body 22 is partially cut or not.

[0048] The easy-to-cut sections 58, which can be easily cut when loaded with a tension in a circumferential direction of the tamper-proof ring 24, are provided on at least one point on the ring. This allows the tamper-proof ring 24 to be cut and split at the positions of the easy-to-cut sections 58 when the cap 16 is opened.

[0049] The tamper-proof ring 24 of the embodiment has a circular structure in which the ends of the ring pieces 64 formed as two arc shapes are connected to one another by the easy-to-cut sections 58. These easy-to-cut sections 58 are arranged, for example, at intervals of 180 degrees with respect to the central axis of the cap 16. On the inner peripheral surface of the ring pieces 64, the tapered and almost trapezoidal lugs 66 and 68 are protrusively provided at two positions for each ring piece 64 so as to be slightly slanted toward the opening direction X.

[0050] The easy-to-cut sections 58 have enough strength to connect the ends of the two ring pieces 64 to one another when the cap 16 is not yet opened. When the cap 16 is opened, on the other hand, the easy-to-cut sections 58 have enough fragility to disconnect the ends of the two ring pieces 64 from one another. The easy-to-cut sections 58 are not specifically limited as long as they have such a structure, and may be formed as, for example, cuts in the width direction and/or thickness direction of the tamper-proof ring 24.

[0051] Positions where the lugs 66 are formed are on the closing direction Y side behind the easy-to-cut sections 58 when the cap 16 sealing the spout 14 is turned in the opening direction X, and are relatively near the easy-to-cut sections 58. Positions where the lugs 68 are formed are on the closing direction Y side behind the easy-to-cut sections 58 when the cap 16 is turned in the opening direction X, and are somewhat behind the lugs 66. The two ring pieces 64 are each formed with the lugs 66 and 68, where the lugs 66 are symmetrically arranged with respect to the central axis of the cap 16 and the lugs 68 are also symmetrically arranged with respect to the same axis.

[0052] The tamper-proof ring 24 is connected to the lower end of the skirt part 52 of the cap body 22 at one

or more points on the ring by the easy-to-cut connecting pieces 60 and hard-to-cut connecting pieces 62. As shown in Figure 4 (A), one or more points connected by the easy-to-cut connecting pieces 60 and one or more points connected by the hard-to-cut connecting pieces 62 exist between the tamper-proof ring 24 and the lower end of the skirt part 52 of the cap 16.

[0053] The tamper-proof ring 24 of the embodiment is provided with the easy-to-cut connecting pieces 60, each of which corresponds to the position of the lug 68 of each ring piece 64. The tamper-proof ring 24 is further provided with the hard-to-cut connecting pieces 62, each of which is on each ring piece 64. The positions where the hard-to-cut connecting pieces 62 are provided are also near and ahead of the easy-to-cut sections 58 that follow.

[0054] The material of the above-described cap 16 is not specifically limited, and includes, for example, the synthetic resins mentioned for the material of the spout 14.

[0055] A tamper-proof function using a combination of the spout 14 and the cap 16 (a spout 14 and cap 16 assembly) will be described next.

[0056] When the cap 16 closing the spout 14 is turned in the opening direction X, the lugs 66 and 68 on the inner peripheral surface of the tamper-proof ring 24 engage with the rachets 41 and 43 provided on the spout 14. This causes a tension in the circumferential direction of the tamper-proof ring 24 and results in cutting of the tamper-proof ring 24 at the positions of the easy-to-cut sections 58, and thus the tamper-proof function of the cap 16 is carried out.

[0057] The easy-to-cut connecting pieces 60 connecting the tamper-proof ring 24 to the cap body 22 are cut almost at the same time as the easy-to-cut sections 58 are cut. This allows the tamper-proof ring 24 to be effectively loaded at the positions of the easy-to-cut sections 58 with the tension occurring in the circumferential direction of the tamper-proof ring 24, and ensures the cutting at the positions of the easy-to-cut sections 58.

[0058] On the other hand, the hard-to-cut connecting pieces 62 connecting the tamper-proof ring 24 to the cap body 22 are not cut during the opening operation, and the tamper-proof ring 24 remains attached to the cap body 22 after completion of the opening. In this way, the tamper-proof ring 24 of the embodiment is split into the two or more ring pieces 64 with the connection to the cap body 22 partially maintained by the hard-to-cut connecting pieces 62. Therefore, the tamper-proof ring 24 does not remain on the spout 14 after opening of the cap 16, and the mouth of a consumer does not touch a prickle or the like resulted from cutting between the tamper-proof ring 24 and the cap body 22 when the consumer eats or drinks the contents of the spouted pouch 10.

[0059] The above is a description of a configuration of the spout 14 and the cap 16. The first flange 32A and the second flange 32B of the flange part 32 of the spout 14 of the embodiment will be described in detail next with reference to Figures 3 to 5. Figure 5 shows a size relation between the first flange 32A and the tamper-proof ring 24.

[0060] Now, a conventional spouted pouch might bring a consumer a feeling of discomfort when a cap is opened or when the consumer grips the spouted pouch reattached with a cap after its opening, since an end, a prickle, or the like of a cut piece of a cut tamper-proof ring touches the consumer's fingers gripping the pouch, mouth, or the like.

[0061] In view of the above, as shown in Figure 5, the outer diameter A_D of the first flange 32A of the embodiment in a front-rear direction of the bag body 12 is sized equal to or larger than the outer diameter C_D of the tamper-proof ring 24 of the cap 16 in the front-rear direction of the bag body 12. That is, the first flange 32A covers the entire lower part of the tamper-proof ring 24 in the front-rear direction of the bag body 12.

[0062] Such a configuration causes the first flange 32A to be put between the tamper-proof ring 24 and fingers if a consumer puts the thumb on a flange below the first flange 32A or on the attachment part 39 attached to the bag body 12 to grip the spouted pouch 10 when opening the cap 16. In other words, the first flange 32A is positioned below the tamper-proof ring 24 so as to cover the fingers. Therefore, after opening of the cap 16, ends of the ring pieces 64, which are cut pieces of the tamper-proof ring 24 that has split with the connection to the cap body 22 partially maintained, do not touch the fingers of the consumer. As a result, the spouted pouch 10 of the embodiment does not bring a consumer gripping the spouted pouch 10 a feeling of discomfort due to ends of the ring pieces 64 of the cut tamper-proof ring 24.

[0063] It is preferable that the difference between the outer diameter A_D of the first flange 32A and the outer diameter C_D of the tamper-proof ring 24 in the front-rear direction of the bag body 12 is between 0 mm and 1.5 mm inclusive. The outer diameter A_D of the first flange 32A being too large in the front-rear direction might cause the first flange 32A to hit below the mouth of a consumer drinking the contents through the mouthpiece part 34 and bring the consumer a feeling of discomfort. Additionally, if the outer diameter A_D of the first flange 32A is too large when two or more spouted pouches 10 are closely arranged in a holder 69 or the like for filling of the contents as shown in Figure 6, the number of spouted pouches 10 that can be arranged in one holder 69 decreases.

[0064] The holder 69 in Figure 6 comprises a pair of flat members 69A, and has a form in which the pair of flat members 69A hold the left and right sides of spouted pouches 10 in spaces between their first flanges 32A and second flanges 32B. The form of the holder 69 is not limited to the one in Figure 6, and may be other forms as long as it holds the left and right sides of spouted pouches 10 in spaces between their first flanges 32A and second flanges 32B.

[0065] Setting the difference between the outer diameter A_D of the first flange 32A and the outer diameter C_D of the tamper-proof ring 24 to be equal to or smaller than 1.5 mm as just described allows a consumer to eat or

drink the contents without experiencing a feeling of discomfort below the mouth, and allows for arranging a greater number of spouted pouches 10 in the holder 69 or the like.

[0066] Sizes of the outer diameter A_D of the first flange 32A and the outer diameter C_D of the tamper-proof ring 24 of the cap 16 in a left-right direction of the bag body 12 are not specifically limited. For example, the range in which the relation between sizes of the outer diameter A_D of the first flange 32A and the outer diameter C_D of the tamper-proof ring 24 is $A_D \geq C_D$ may be defined by an angle. It is preferable that the outer diameter A_D of the first flange 32A is equal to or larger than the outer diameter C_D of the tamper-proof ring 24 in zones of central 95 degrees or larger (an angle θ in Figure 3) in 180 degrees on the front side and 180 degrees on the rear side with respect to the center of the tube part 30 of the spout 14. If the range is 95 degrees or larger, the first flange 32A can cover part of the tamper-proof ring 24 that may touch fingers of a consumer gripping the spouted pouch 10.

[0067] The outer diameter A_D of the first flange 32A may be equal to or larger than the outer diameter C_D of the tamper-proof ring 24 also throughout 360 degrees that combined the front-side 180 degrees and the rear-side 180 degrees, but a consumer would not grip the flange part 32 in the left-right direction of the bag body 12. Additionally, it is difficult to tamper the inner peripheral surface of the tamper-proof ring 24 from below in the left-right direction of the bag body 12. Therefore, in the left-right direction of the bag body 12, the first flange 32A just has to have an enough width to catch the holder 69, and the outer diameter of the tamper-proof ring 24 may be larger than the outer diameter of the first flange 32A.

[0068] Covering the entire lower part of the tamper-proof ring 24, the first flange 32A of the embodiment can prevent the tamper-proof ring 24 from being tampered from below. For example, a conventional spouted pouch has a tamper-proof ring extending outward beyond a flange part in a front-rear direction of a bag body, and therefore a tamper-proof function might be tampered from below the tamper-proof ring. However, the combination of the spout 14 and the cap 16 of the embodiment can prevent the tampering from below since the first flange 32A extends outward beyond the tamper-proof ring 24 in the front-rear direction of the bag body 12.

[0069] The first flange 32A of the embodiment is formed with straight sections 33A in a direction parallel to the pair of plane parts 20A and 20B of the bag body 12.

[0070] Now, for example, when two or more spouted pouches 10 are arranged in the front-rear direction of the bag body 12 and carried for filling of the contents as shown in Figure 6, adjacent spouted pouches 10 come into contact with one another at their first flanges 32A. If the first flanges 32A are shaped like an arc, adjacent spouted pouches 10 come into point contact with one another. Adjacent spouted pouches 10 coming into point contact with one another might cause instability, and might cause troubles such as misalignment and an inability to carry due to overlapping of flange parts 32 of the adjacent spouted pouches 10 or the like in such a case as when two or more spouted pouches 10 are arranged and carried.

[0071] On the other hand, forming the straight sections 33A on the first flange 32A as in the embodiment causes the adjacent spouted pouches 10 to have these straight sections 33A in contact. Since the straight sections 33A have a height (the thickness of the first flange 32A), adjacent spouted pouches 10 are caused to have their surfaces in contact, and the positions of the adjacent spouted pouches 10 stabilize. Therefore, the spouted pouches 10 of the embodiment can be prevented from misalignment such as overlapping of flange parts 32 of adjacent spouted pouches 10 when two or more spouted pouches 10 are arranged and carried.

[0072] Note that the straight sections 33A just have to allow adjacent spouted pouches 10 to stably maintain their positions, and their thickness is, for example, 1.0 mm to 2.0 mm and preferably about 1.6 mm. Their length A_L is equal to or smaller than the length B_L of later-described straight sections 35 of the second flange 32B, and is 2.0 mm to 16 mm and preferably about 7 mm. The first flange 32A of the embodiment is formed to be straight (straight sections 33B) also in the front-rear direction of the bag body 12, but the shape in the front-rear direction of the bag body 12 is not limited to this and may be approximately arc-like.

[0073] In the spout 14 of the embodiment, the second flange 32B is formed to be shorter than the first flange 32A in length in the front-rear direction of the bag body 12.

[0074] In other words, in the spout 14 provided with the flange part 32 having two tiers of flanges, namely, the first flange 32A and the second flange 32B, the outer diameter A_D of the first flange 32A on the topside (the upper side) is larger than the outer diameter B_D of the second flange 32B on the base-end side (the lower side), and the first flange 32A protrudes in the front-rear direction of the bag body 12.

[0075] The second flange 32B is formed to be straight (straight sections 35) in the direction parallel to the pair of plane parts 20A and 20B of the bag body 12. The length B_L of the straight sections 35 of the second flange 32B is equal to or larger than the length A_L of the straight sections 33A of the first flange 32A.

[0076] Such shapes of the first flange 32A and the second flange 32B make a consumer feel easier to grip the second flange 32B than the first flange 32A, and lead the consumer to grip the second flange 32B rather than the first flange 32A. Therefore, the shapes can more reliably prevent fingers or the like of a consumer gripping the spouted pouch 10 from touching an end, a prickle, or the like of a cut piece of the tamper-proof ring 24. Additionally, even if the number of flanges in the flange part 32 of the spout 14, which are the first flange 32A and the second flange 32B, is the smallest number, two, and the section to be gripped is near the tamper-proof ring 24 in the ver-

tical direction as in the embodiment, the shapes do not bring a consumer gripping the spouted pouch 10 a feeling of discomfort due to an end of the cut tamper-proof ring 24.

[0077] If the spout 14 is provided with a flange part 32 having three or more tiers of flanges, the outer diameter A_D of the first flange 32A on the topside just has to be formed the largest so that the first flange 32A protrudes the most in the front-rear direction of the bag body 12.

[0078] While the disclosure has been described with reference to the above embodiment, the technical scope of the disclosure is not limited to the scope provided by the embodiment. Various modifications or improvements can be made to the embodiment without departing from the gist of the disclosure, and those added with the modifications or improvements are also included in the technical scope of the disclosure.

[0079] While a description has been made for the above embodiment on a mode in which the bag body 12 of the spouted pouch 10 is a pouch having the pair of plane parts 20A and 20B and a pair of side parts, the disclosure is not limited to this, and the bag body 12 just has to have the pair of plane parts 20A and 20B holding the spout 14 therebetween. For example, the bag body 12 may be a bottom gusset pouch having a bottom part, and a square bottom pouch having a bottom part and a pair of side parts.

[0080] While a description has been made for the above embodiment on a mode in which the shape of the first flange 32A is almost circular, the disclosure is not limited to this. It will suffice for the outer diameter A_D of the first flange 32A to be equal to or larger than the outer diameter C_D of the tamper-proof ring 24 and, for example, the shape of the first flange 32A may be a quadrangle, a pentagon, or other rectangles. If the shape of the first flange 32A is a rectangle, the rectangle may be rounded.

[0081] While a description has been made for the above embodiment on a mode in which the second flange 32B is formed with the straight sections 35 in the direction parallel to the pair of plane parts 20A and 20B of the bag body 12, the disclosure is not limited to this. For example, the second flange 32B nearer the base end than the first flange 32A may be formed with hollows 70 in the direction parallel to the pair of plane parts 20A and 20B of the bag body 12 as shown in Figure 7. The hollows 70 are concaved toward the mouthpiece part 34 (the tube part 30), and are shaped like an arc so as to fit fingers of a consumer gripping the spouted pouch 10 at the second flange 32B. This allows a consumer to avoid pain and a feeling of discomfort in fingers caused by gripping the second flange 32B. The deepest positions of the hollows 70 are the same as the outer diameter of the attachment part 39. This allows a consumer to grip the attachment part 39 as well as the second flange 32B and therefore grip the spouted pouch 10 more stably.

[0082] The spout 14 may be provided with an elongated and tubular straw part 28 on the lower part of the attachment part 39. The straw part 28 is shaped like an elongated cylinder, and is inserted inside the bag-like bag body 12.

[0083] The shapes and numbers of the easy-to-cut sections 58, the easy-to-cut connecting pieces 60, the hard-to-cut connecting pieces 62, the ribs 40, 42, and 44, the rachets 41 and 43, the lugs 66 and 68, the ring pieces 64, and the like of the embodiment and the shape of the cap body 22 of the embodiment are not limited to their shapes and numbers in the embodiment. In addition, the tamper-proof mechanism is not limited to the form in the embodiment, either, as long as it takes a form in which the tamper-proof ring 24 circumferentially splits into a plurality of pieces with the connection to the cap body 22 partially maintained. Moreover, the spout 14 and the cap 16 are not limited to those which are made to be reclosable by the male thread 36 and the female thread 54 screwing together. For example, there may be an easy-to-unseal spout 14 and cap 16 combination where a spout 14 is closed by capping with a cap 16 and the cap 16 can be opened with a slight turning angle.

DESCRIPTION OF THE SYMBOLS

[0084]

10: Spouted pouch
12: Bag body
14: Spout
16: Cap
24: Tamper-proof ring
30: Tube part
32: Flange part
32A: First flange (Top flange)
32B: Second flange (Base-end flange)
70: Hollow

Claims

1. A spout put between and attached to a pair of plane parts comprising front and rear surfaces forming a bag body, the spout comprising:

   a hollow and tubular tube part; and
   a flange part comprising a plurality of flanges provided on an outer peripheral surface of the tube part on a side of a base end thereof,
   wherein a cap having a cap body and a tamper-proof ring connected to the cap body is attached to the tube part on a topside thereof,
   wherein the tamper-proof ring circumferentially splits into a plurality of pieces with the connection to the cap body partially maintained, and
   wherein a topmost top flange of the plurality of flanges is equal to or larger than the tamper-proof ring in outer diameter in a front-rear direction of the bag body.

2. The spout according to claim 1, wherein the top flange has two straight sections parallel to the pair of plane parts.

3. The spout according to claim 1 or 2, wherein a base-end flange nearer the base end than the top flange is shorter than the top flange in length in the front-rear direction of the bag body.

4. The spout according to any one of claims 1 to 3, wherein the base-end flange nearer the base end than the top flange is formed with a hollow in a direction parallel to the pair of plane parts.

5. The spout according to any one of claims 1 to 4, wherein the flange part having the plurality of flanges comprises the two flanges, namely, the top flange and the base-end flange nearer the base end than the top flange.

6. A spout and cap assembly comprising:

the spout according to any one of claims 1 to 5; and
a cap having a cap body and a tamper-proof ring connected to the cap body, the cap being attached to a tube part of the spout on a topside thereof.

7. A spouted pouch comprising:

a bag body formed of a pair of plane parts comprising front and rear surfaces;
the spout according to any one of claims 1 to 6 put between and attached to the pair of plane parts; and
a cap having a cap body and a tamper-proof ring connected to the cap body, the cap being attached to a tube part of the spout on a topside thereof.

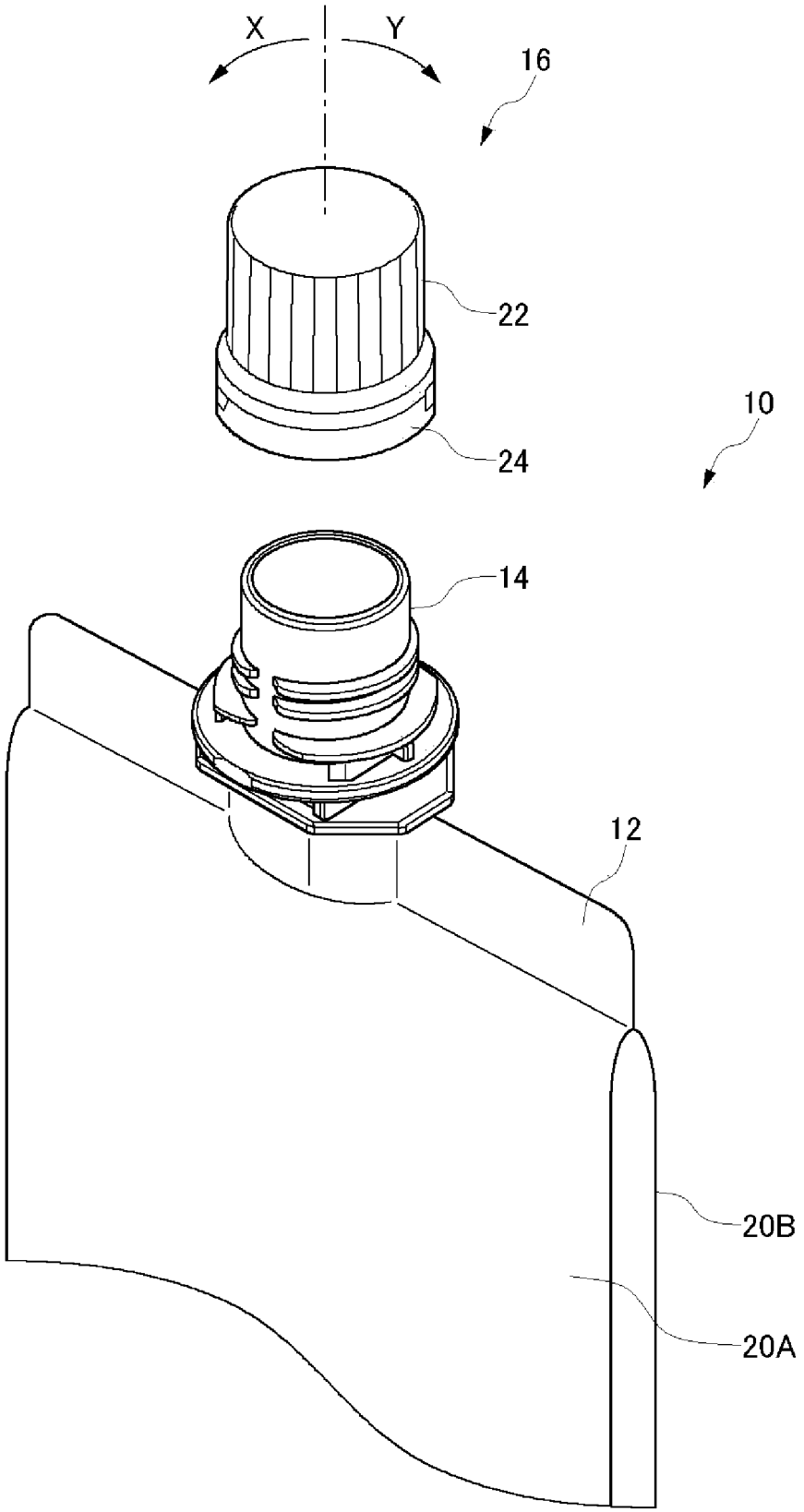


FIG. 1

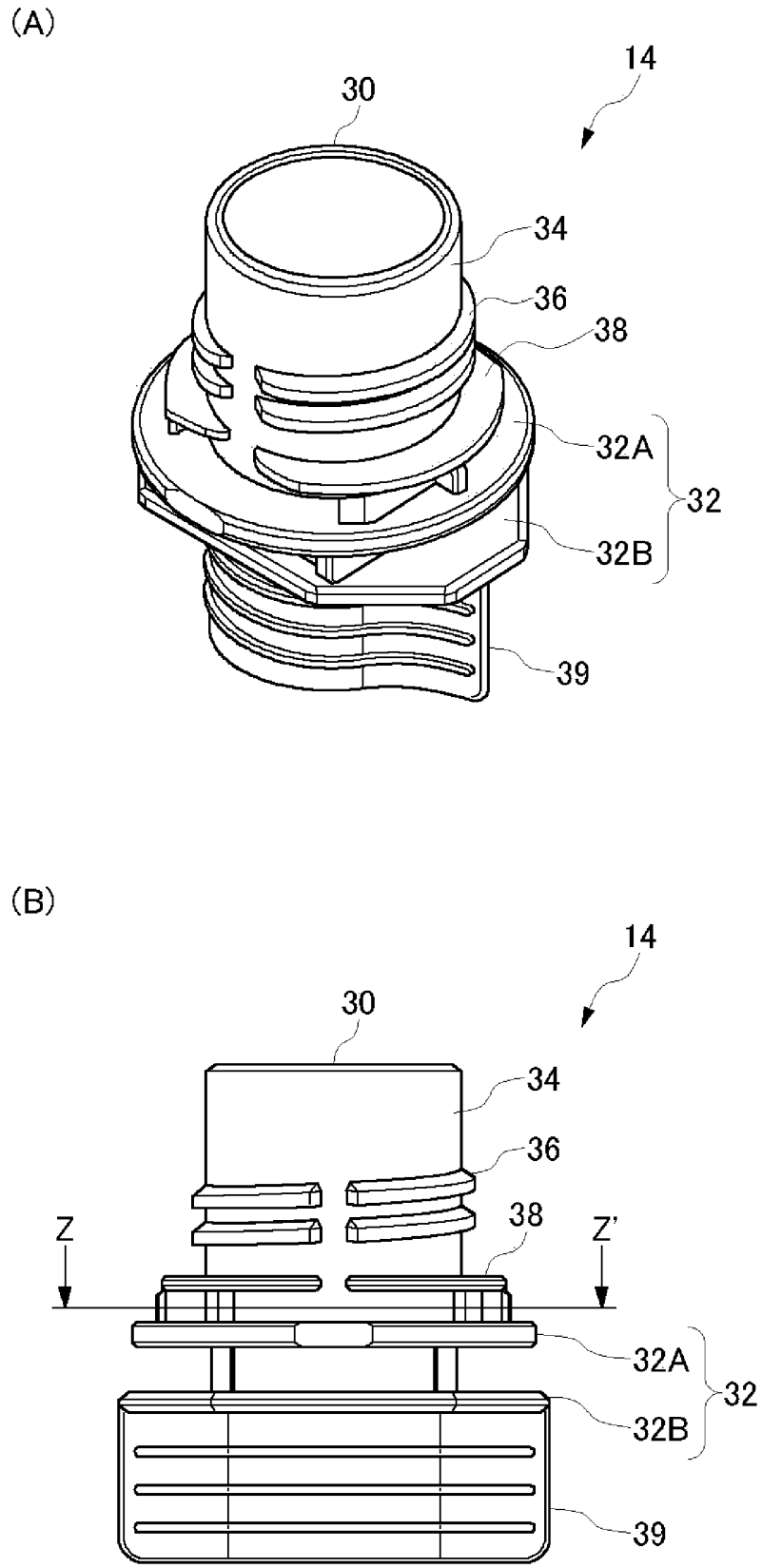


FIG. 2

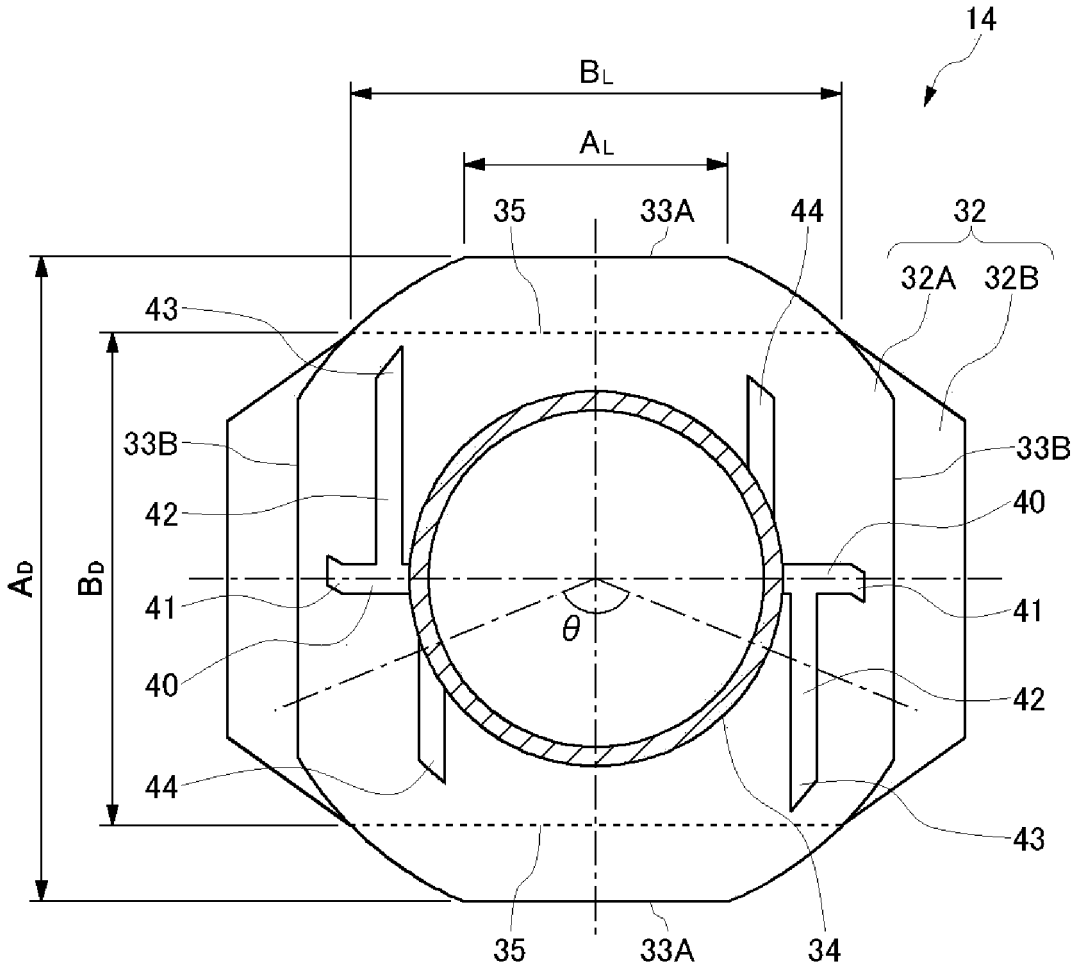
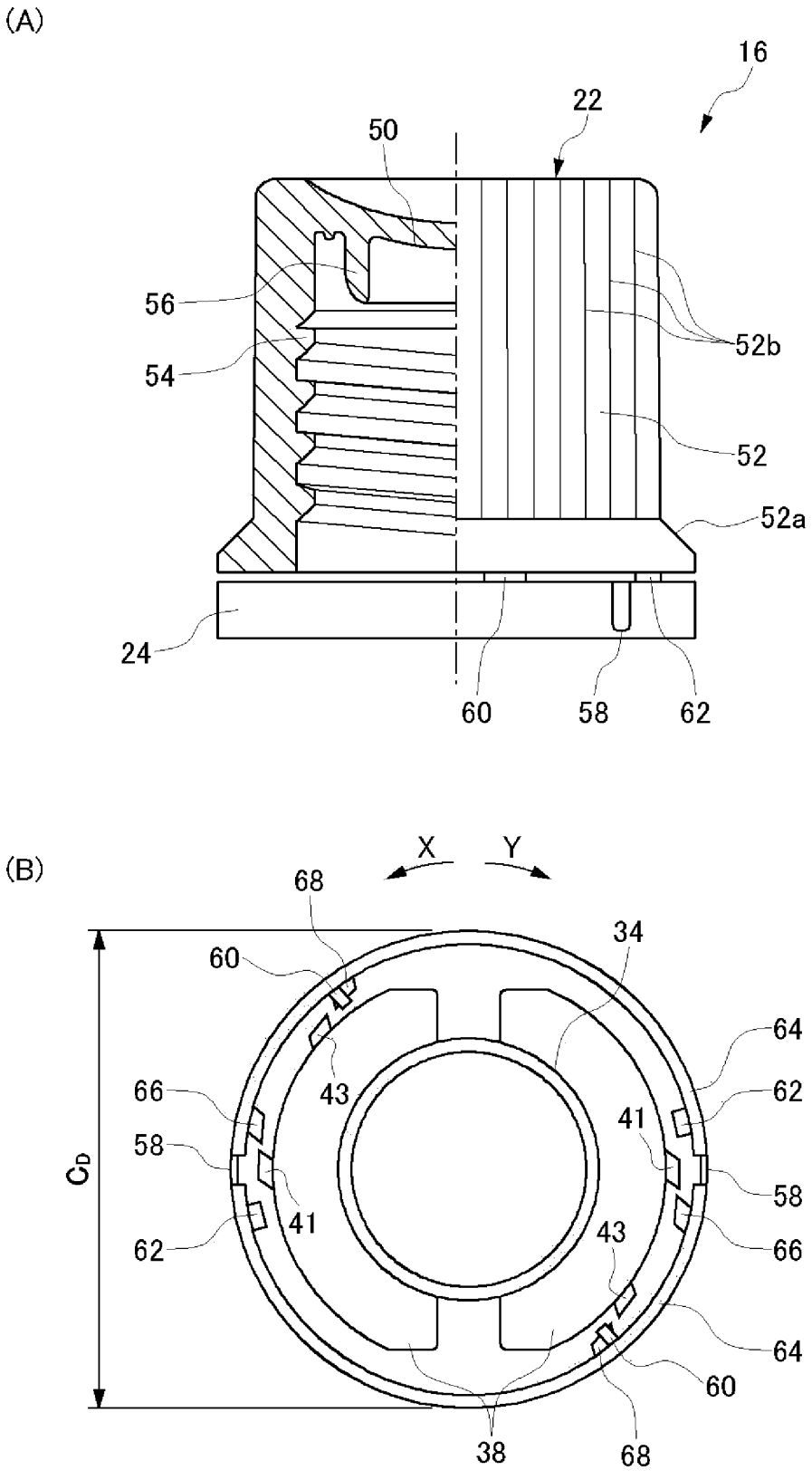


FIG. 3


(A)
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22
50
56
54
52b
52
52a
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(B)
X
Y
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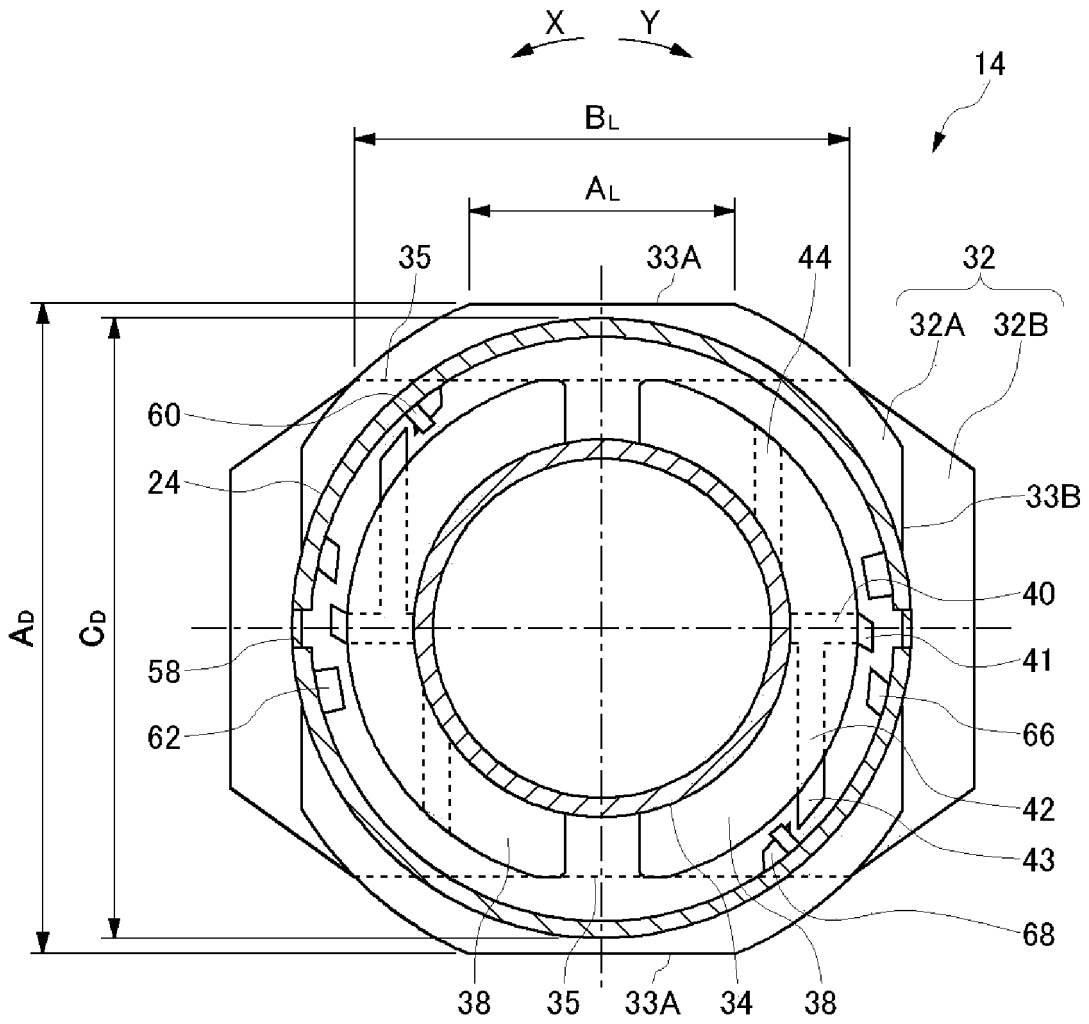
68
C_D

FIG. 4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34
38

FIG. 5

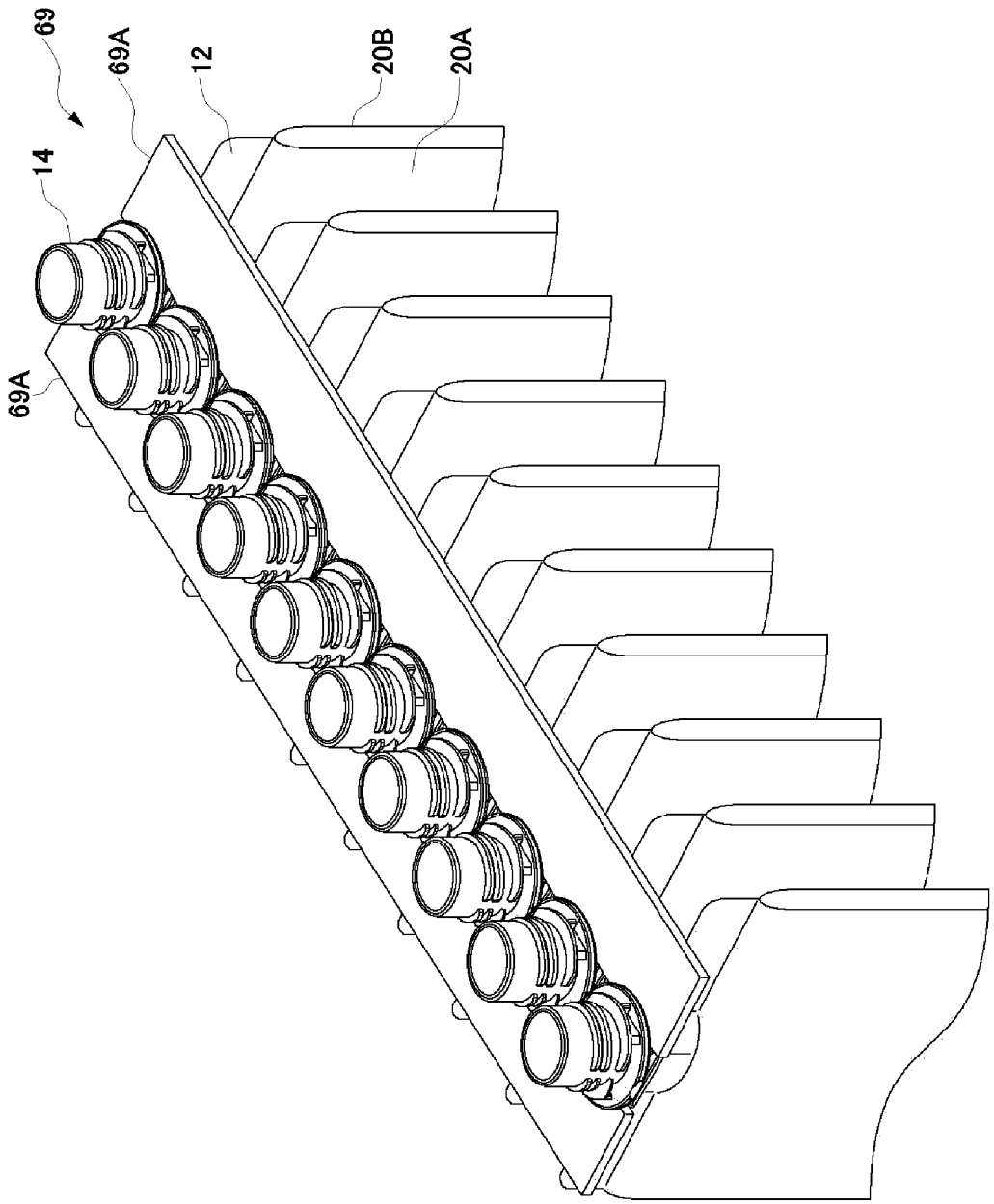

FIG. 6

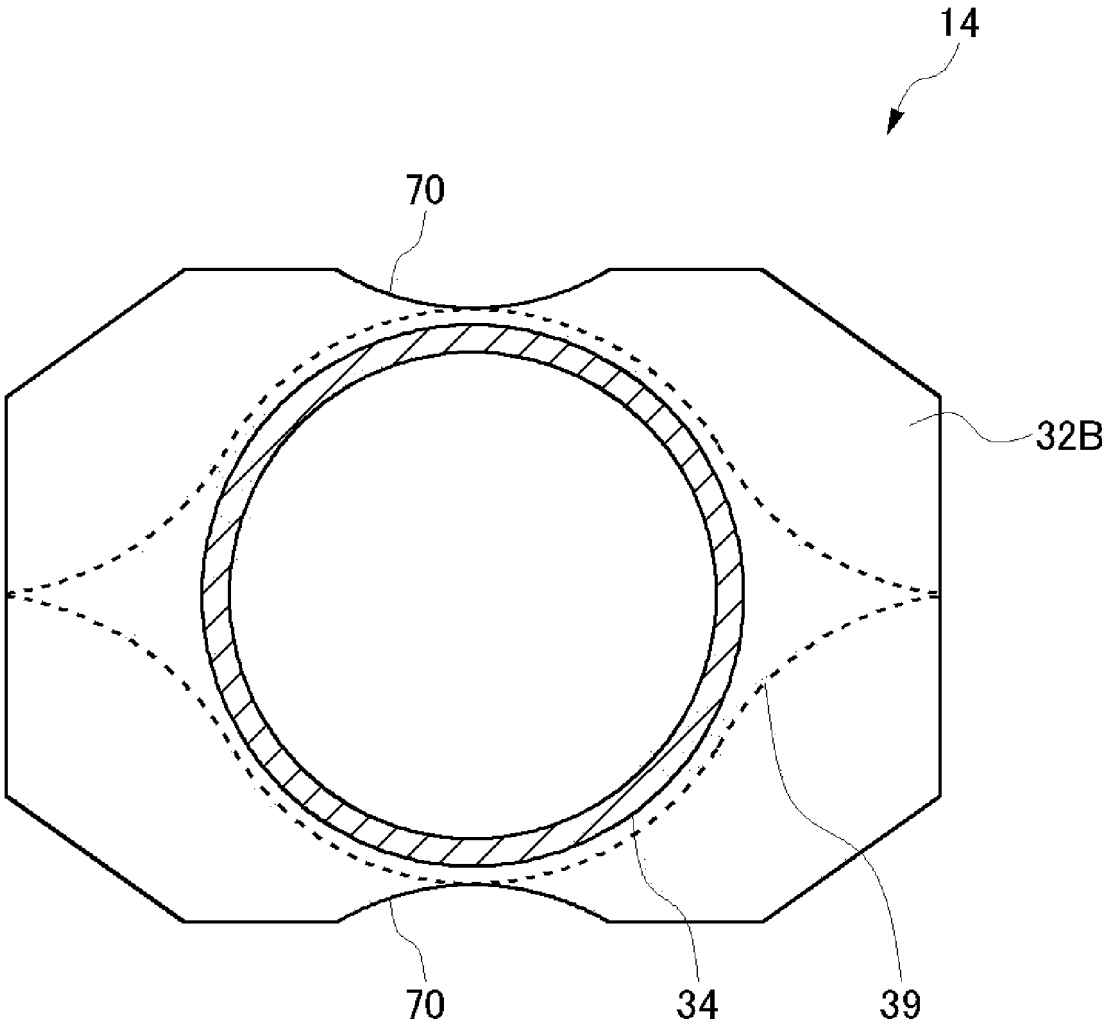

FIG. 7

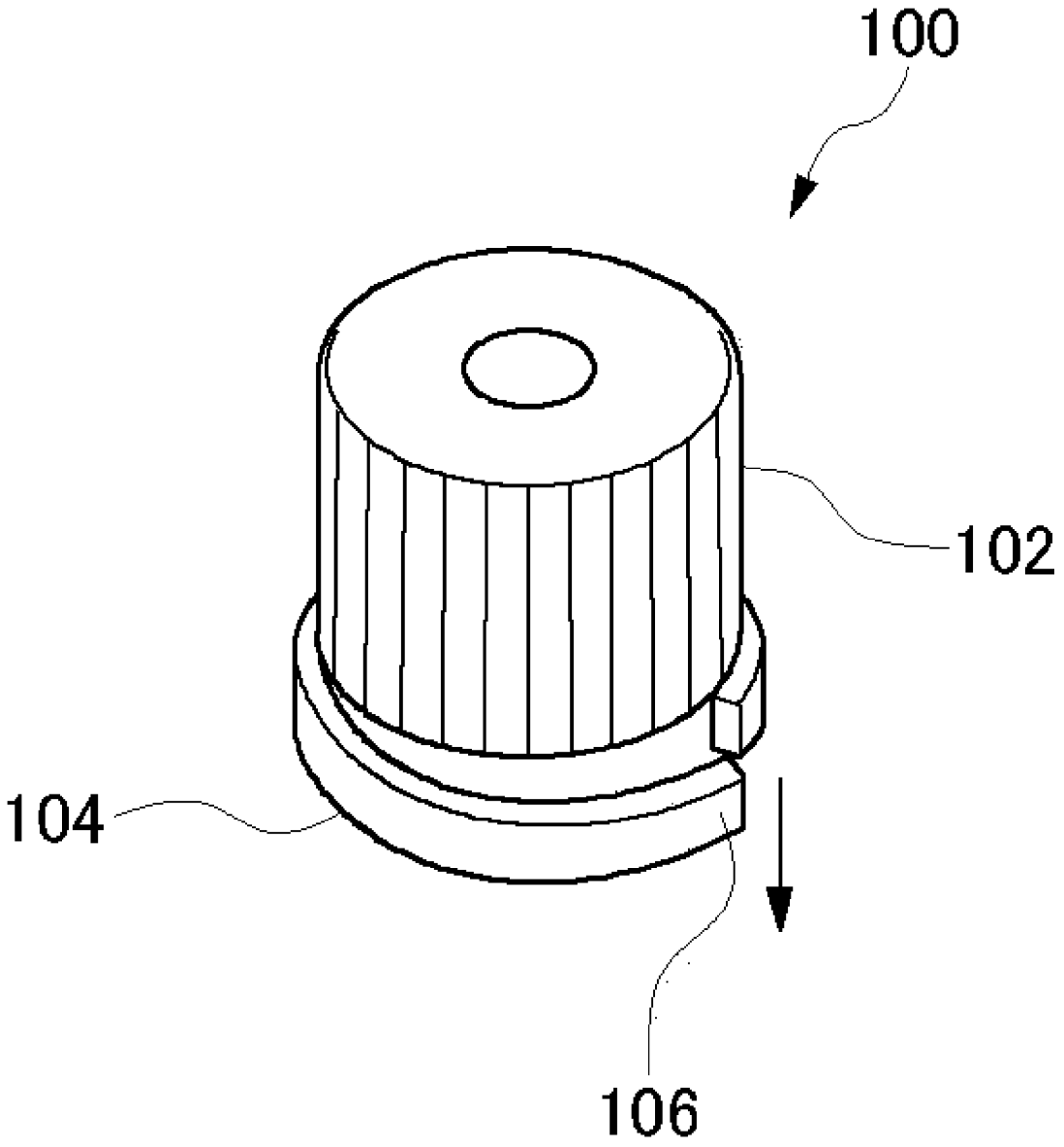

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/021857

A. CLASSIFICATION OF SUBJECT MATTER

B65D 33/38(2006.01)i
FI: B65D33/38

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)

B65D33/38

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 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

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.
Y	JP 2004-331124 A (HOSOKAWA YOKO CO., LTD.) 25 November 2004 (2004-11-25) paragraphs [0018]-[0047], fig. 1-13	1-7
Y	JP 2008-62943 A (DAINIPPON PRINTING CO., LTD.) 21 March 2008 (2008-03-21) paragraphs [0025], [0026], fig. 1-4	1-7
Y	JP 2019-51976 A (HOSOKAWA YOKO CO., LTD.) 04 April 2019 (2019-04-04) paragraph [0071], fig. 15	3-7
Y	JP 2015-168478 A (DAINIPPON PRINTING CO., LTD.) 28 September 2015 (2015-09-28) paragraphs [0029]-[0032], fig. 2, 6	4-7
Y	JP 2011-105315 A (TENRYU CHEMICAL ENGINEERING CO., LTD.) 02 June 2011 (2011-06-02) paragraphs [0021]-[0023], fig. 3	5-7

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

* Special categories of cited documents:
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"P" document published prior to the international filing date but later than the priority date claimed
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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
24 June 2022	**19 July 2022**
Name and mailing address of the ISA/JP **Japan Patent Office (ISA/JP)** **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/021857

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 2004-331124 A	25 November 2004	CN 1541905 A	
JP 2008-62943 A	21 March 2008	(Family: none)	
JP 2019-51976 A	04 April 2019	(Family: none)	
JP 2015-168478 A	28 September 2015	(Family: none)	
JP 2011-105315 A	02 June 2011	(Family: none)	

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

REFERENCES CITED IN THE DESCRIPTION

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- JP 2021117121 A **[0001]**
- JP 2015168478 A **[0004]**
- JP 2004331124 A **[0008]**