**(12) STANDARD PATENT APPLICATION** (11) Application No. **AU 2025223758 A1**
**(19) AUSTRALIAN PATENT OFFICE**

(54) Title
**SPOUT UNIT, PACKAGE, AND CONTENTS-FILLED PACKAGE**

(51) International Patent Classification(s)
***B65D 41/04*** (2006.01) ***B65D 41/34*** (2006.01)
***B65D 33/38*** (2006.01) ***B65D 75/58*** (2006.01)

(21) Application No: **2025223758** (22) Date of Filing: **2025.08.27**

(30) Priority Data

| (31) Number | (32) Date | (33) Country |
|---|---|---|
| **2024-151057** | **2024.09.02** | **JP** |
| **2024-151058** | **2024.09.02** | **JP** |

(43) Publication Date: **2026.03.19**
(43) Publication Journal Date: **2026.03.19**

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ABSTRACT

A spout unit includes a cap with a cap projection and a spout with a spout projection. When the cap rotates in a closing direction, the cap projection crosses the spout projection. When the spout fixed to a package body is observed downward in the vertical direction, the spout projection is in a left region or a right region. The left and right regions are demarcated by a first line and a second line, and share a reference line orthogonal to a center axis of the spout and extending in the long direction of the package body. The first line is the reference line rotated at an angle of 50° about the center axis in the closing direction, and the second line is the reference line rotated at an angle of 50° about the center axis in a direction opposite to the closing direction.

[Figure 4]

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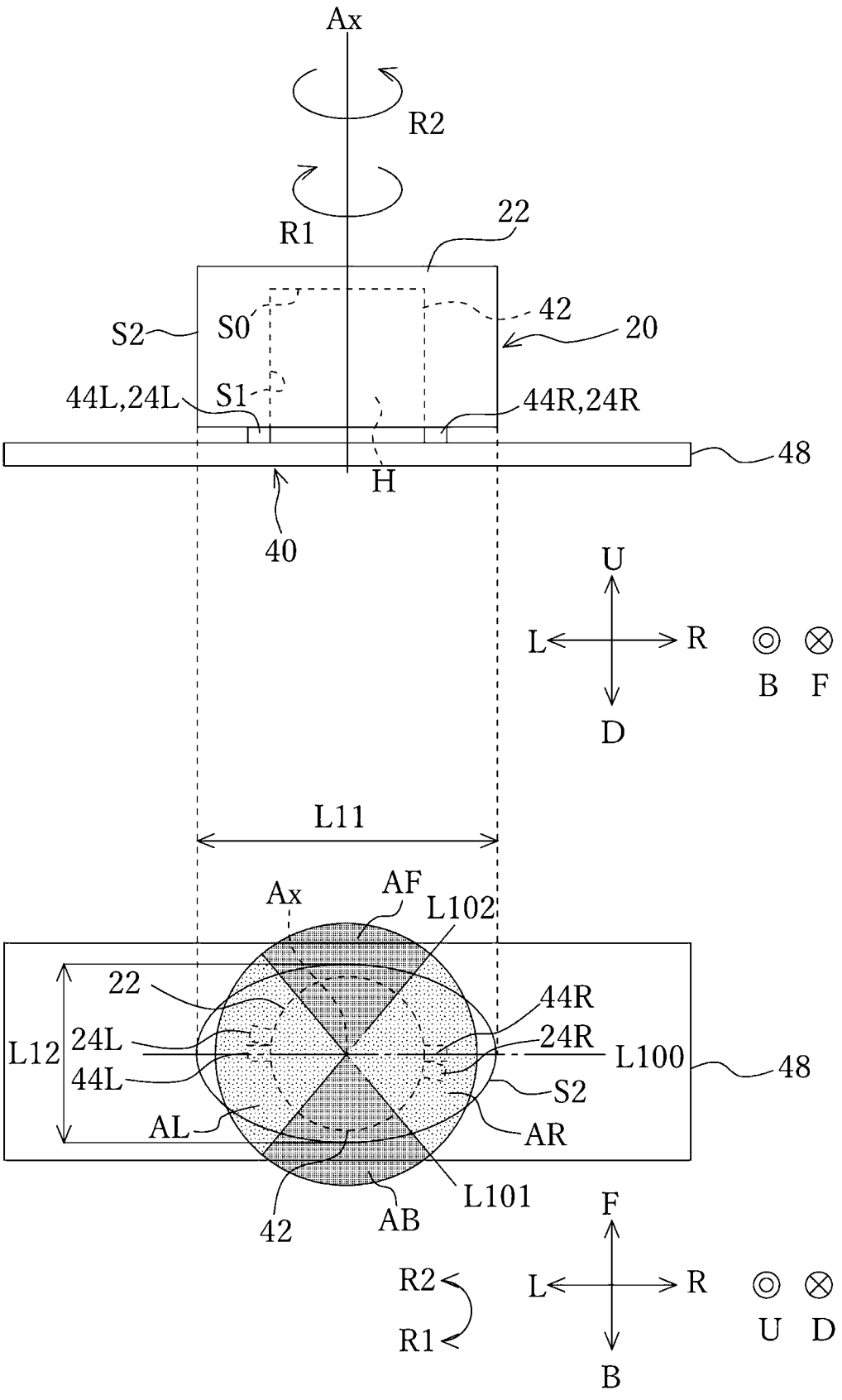
FIG. 4



# SPOUT UNIT, PACKAGE, AND CONTENTS-FILLED PACKAGE

## CROSS-REFERENCE TO RELATED APPLICATION

This application is based on Japanese Patent Application No. 2024-151057 filed with the Japan Patent Office on September 02, 2024, and on Japanese Patent Application No. 2024-151058 filed with the Japan Patent Office on September 02, 2024, the entire contents of which are hereby incorporated by reference.

## BACKGROUND

### 1. Technical Field

The present disclosure relates to a spout unit, a package, and a contents-filled package.

### 2. Related Art

The following discussion of background art is included to explain the context of the present invention. A reference herein to a matter which is given as prior art is not to be taken as an admission that the matter was known or that the information it contains was part of the common general knowledge as at the priority date of any of the claims.

As previously existing spout units, for example, a spout unit described in JP-A-2008-143536 is known. The spout unit is formed of a spout that includes a tubular mouth part and a cap that closes the mouth part of the spout. The cap has a tamper-proof ring coupled to the lower end portion of the cap through an easy-cut coupling piece. The tamper-proof ring is provided with an easy-cut portion that is cut by pull strength in the circumferential direction and a nail portion that engages with a ratchet

provided on the spout side. In at least two positions around the mouth part of the spout, a tamper-proof ring support portion is provided. The tamper-proof ring support portion has a height that contacts a part of the lower surface of the tamper-proof ring when screwed onto the cap, maintaining the horizontal position of the tamper-proof ring at a constant height.

Such a spout unit has a tamper-proof function. The function enables easy visual determination that the spout unit has been opened when the unopened cap of the spout unit is opened. When the spout is sealed with the cap, this spout unit enables the correction of deformation produced as the easy-cut portion of the tamper-proof ring serves as the base point, while no strong force is necessary when the spout is opened.

## SUMMARY

A spout unit according to a first embodiment includes a cap and a spout. In the spout unit,

the cap includes a cap main body and a cap projection,

the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface,

the cap main body inner circumferential surface is provided with a first screw thread or a first screw groove,

the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection,

the spout main body has a cylindrical shape,

a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed,

the spout main body is provided with a second screw groove engaged with the

first screw thread or a second screw thread engaged with the first screw groove,

the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout,

when the spout is closed, a length of the cap main body in a long direction of the package main body to which the spout is fixed is longer than a length of the cap main body in a short direction of the package main body, and a length of the cap projection in the vertical direction of the package main body to which the spout is fixed is shorter than a length of the cap projection in a cap rotation direction,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the spout projection is positioned in a left region or a right region,

the left region and the right region are demarcated by a first straight line and a second straight line, and the left region and the right region include a reference straight line,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the reference straight line is orthogonal to the center axis and extends in the long direction of the package main body,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the first straight line is the reference straight line rotated at an angle of 50° about the center axis in the closing rotation direction, and

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the second straight line is the reference straight line rotated at an angle of 50° about the center axis in a direction opposite to the

closing rotation direction.

A spout unit according to a second embodiment includes a cap and a spout. In the spout unit, the cap includes a cap main body and a cap projection,

the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface,

the cap main body inner circumferential surface is provided with a first screw thread or a first screw groove,

the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection,

the spout main body has a cylindrical shape,

a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed,

the spout main body is provided with a second screw groove engaged with the first screw thread or a second screw thread engaged with the first screw groove,

the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout,

the cap projection and the spout projection have configuration A or configuration B below,

configuration A:

the cap projection includes a first section and a second section,

the first section is positioned in front of the second section in the closing rotation direction,

when the cap projection is observed in a direction orthogonal to a first direction and the closing rotation direction, an outer edge of the cap projection in the first section

extends in the first direction, as extending toward the closing rotation direction,

an outer edge of the cap projection in the second section extends in the first direction, as extending toward a direction opposite to the closing rotation direction,

the first direction is a direction from the spout projection to the cap projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which the cap rotates in the closing rotation direction to close the spout, and

a length of the first section in a cap rotation direction is longer than a length of the second section in the cap rotation direction, and

configuration B:

the spout projection includes a third section and a fourth section,

the fourth section is positioned in front of the third section in the closing rotation direction,

when the spout projection is observed in a direction orthogonal to a second direction and the closing rotation direction, an outer edge of the spout projection in the third section extends in the second direction, as extending toward a direction opposite to the closing rotation direction,

an outer edge of the spout projection in the fourth section extends in the second direction, as extending in the closing rotation direction,

the second direction is a direction from the cap projection to the spout projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which the cap rotates in the closing rotation direction to close the spout, and

a length of the third section in a cap rotation direction is longer than a length of the fourth section in the cap rotation direction.

## BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a perspective view of the appearance of a contents-filled package 1;

FIG. 2 is an exploded perspective view of a spout unit 12;

FIG. 3 is a diagram of a cap 20 and a spout 40 observed in the front-rear direction when the spout 40 is open;

FIG. 4 is a diagram of the cap 20 and the spout 40 observed in the front-rear and vertical directions when the spout 40 is closed;

FIG. 5 shows a diagram of a cap projection 24R observed in a third direction d3 and a diagram of the cap projection 24R observed in an opening rotation direction R2;

FIG. 6 shows a diagram of a spout projection 44R observed in the third direction d3 and a diagram of the spout projection 44R observed in the opening rotation direction R2;

FIG. 7A is a diagram of the cap projection 24R and the spout projection 44R observed in the third direction d3;

FIG. 7B is a diagram of the cap projection 24R and the spout projection 44R observed in the third direction d3;

FIG. 7C is a diagram of the cap projection 24R and the spout projection 44R observed in the third direction d3;

FIG. 7D is a diagram of the cap projection 24R and the spout projection 44R observed in the third direction d3;

FIG. 8 shows a diagram of the spout projection 44R observed in the third direction d3 and a diagram of the spout projection 44R observed in the opening rotation

direction R2; and

FIG. 9 shows a diagram of the cap projection 24R observed in the third direction d3 and the cap projection 24R observed in the opening rotation direction R2.

## DETAILED DESCRIPTION

In the following detailed description, for purpose of explanation, numerous specific details are set forth in order to provide a thorough understanding of the disclosed embodiments. It will be apparent, however, that one or more embodiments may be practiced without these specific details. In other instances, well-known structures and devices are schematically shown in order to simplify the drawing.

In the spout unit described in JP-A-2008-143536, the cap sometimes becomes loose after the spout is sealed with the cap. In the field of the spout unit described in JP-A-2008-143536, a mechanism is desired that can recognize the completion of closing the spout with the cap.

Therefore, an object of the present embodiment is to provide a spout unit, a package, and a contents-filled package capable of reducing the possibility of loosening a cap. Another object of the present embodiment is to provide a spout unit, a package, and a contents-filled package capable of recognizing the completion of closing the spout with the cap.

A spout unit according to a first embodiment includes a cap and a spout. In the spout unit, the cap includes a cap main body and a cap projection, the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface, the cap main body inner circumferential surface is provided with a first screw thread or a first screw groove, the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection, the spout

main body has a cylindrical shape, a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed, the spout main body is provided with a second screw groove engaged with the first screw thread or a second screw thread engaged with the first screw groove, the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout, when the spout is closed, a length of the cap main body in a long direction of the package main body to which the spout is fixed is longer than a length of the cap main body in a short direction of the package main body, and a length of the cap projection in the vertical direction of the package main body to which the spout is fixed is shorter than a length of the cap projection in a cap rotation direction, when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the spout projection is positioned in a left region or a right region, the left region and the right region are demarcated by a first straight line and a second straight line, and the left region and the right region include a reference straight line, when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the reference straight line is orthogonal to the center axis and extends in the long direction of the package main body, when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the first straight line is the reference straight line rotated at an angle of 50° about the center axis in the closing rotation direction, and when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the second straight line is the reference straight line rotated at an angle of 50° about the center axis in a direction opposite to the closing rotation direction.

A spout unit according a second embodiment is the spout unit according to the

first embodiment, in which when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, a projection that contacts the cap projection is not provided in either a front region or a rear region, and the front region and the rear region are demarcated by the first straight line and the second straight line, and the front region and the rear region do not include the reference straight line.

A spout unit according to a third embodiment is the spout unit according to the first embodiment or the second embodiment, in which the spout is formed to be fixed to the package main body that accommodates a food.

A spout unit according to a fourth embodiment is the spout unit according to any one of the first embodiment to the third embodiment, in which the cap projection projects downward from a lower end portion of the cap main body in the vertical direction of the package main body, and when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the spout projection projects from the spout main body in a direction apart from the center axis.

A spout unit according to a fifth embodiment is the spout unit according to any one of the first embodiment to the fourth embodiment, in which the cap and the spout main body are formed such that when the cap rotates in the closing rotation direction and the cap projection crosses the spout projection, a top end of the spout main body contacts a top surface of the cap main body.

A package according to a sixth embodiment includes the spout unit according to any one of the first embodiment to the fifth embodiment and the package main body.

A contents-filled package according to a seventh embodiment includes the package according to the sixth embodiment and contents accommodated in the package main body.

A spout unit according to eighth embodiment includes a cap and a spout. In the spout unit, the cap includes a cap main body and a cap projection, the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface, the cap main body inner circumferential surface is provided with a first screw thread or a first screw groove, the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection, the spout main body has a cylindrical shape, a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed, the spout main body is provided with a second screw groove engaged with the first screw thread or a second screw thread engaged with the first screw groove, the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout, the cap projection and the spout projection have configuration A or configuration B below,

configuration A:

the cap projection includes a first section and a second section, the first section is positioned in front of the second section in the closing rotation direction, when the cap projection is observed in a direction orthogonal to a first direction and the closing rotation direction, an outer edge of the cap projection in the first section extends in the first direction, as extending toward the closing rotation direction, an outer edge of the cap projection in the second section extends in the first direction, as extending toward a direction opposite to the closing rotation direction, the first direction is a direction from the spout projection to the cap projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which the cap rotates in the closing rotation direction R1 to close the spout, and a length of the first section in a cap rotation direction is longer

than a length of the second section in the cap rotation direction, and

configuration B:

the spout projection includes a third section and a fourth section, the fourth section is positioned in front of the third section in the closing rotation direction, when the spout projection is observed in a direction orthogonal to a second direction and the closing rotation direction, an outer edge of the spout projection in the third section extends in the second direction, as extending toward a direction opposite to the closing rotation direction, an outer edge of the spout projection in the fourth section extends in the second direction, as extending in the closing rotation direction, the second direction is a direction from the cap projection to the spout projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which the cap rotates in the closing rotation direction to close the spout, and a length of the third section in a cap rotation direction is longer than a length of the fourth section in the cap rotation direction.

A spout unit according to a ninth embodiment is the spout unit according to the eighth embodiment, in which the cap projection and the spout projection have configuration A, the cap projection further includes a fifth section, the second section, the fifth section, and the first section are arranged in this order in the closing rotation direction, and when the cap projection is observed in a direction orthogonal to the first direction and the closing rotation direction, an outer edge of the cap projection in the fifth section is parallel to the closing rotation direction.

A spout unit according to a tenth embodiment is the spout unit according to the ninth embodiment, in which when the spout projection is observed in a direction orthogonal to the first direction and the closing rotation direction, the spout projection

has two sides extending in the closing rotation direction and two sides extending in the first direction, and in the spout projection, two angles formed by the first direction and the cap rotation direction have a beveled shape.

A spout unit according to an eleventh embodiment is the spout unit according to the eighth embodiment, in which the cap projection and the spout projection have configuration B, the spout projection further includes a sixth section, he third section, the sixth section, and the fourth section are arranged in this order in the closing rotation direction, and when the spout projection is observed in a direction orthogonal to the second direction and the closing rotation direction, an outer edge of the spout projection in the sixth section is parallel to the closing rotation direction.

A spout unit according to a twelfth embodiment is the spout unit according to the eleventh embodiment, in which when the cap projection is observed in the direction orthogonal to the second direction and the closing rotation direction, the cap projection has two sides extending in the closing rotation direction and two sides extending in the second direction, and in the cap projection, two angles formed by the second direction and the cap rotation direction have a beveled shape.

A package according to a thirteenth embodiment includes the spout unit according to any one of the eighth embodiment to the twelfth embodiment and the package main body.

A contents-filled package according to a fourteenth embodiment includes the package according to the thirteenth embodiment and contents accommodated in the package main body.

According to the spout unit of the present embodiment, it is possible to reduce the possibility of loosening a cap. The user is recognizable upon completion of closing the spout with the cap.

Embodiment

In the following, a package 10, a spout unit 12, and a contents-filled package 1 according to an embodiment of the present disclosure will be described with reference to the drawings. FIG. 1 is a perspective view of the appearance of the contents-filled package 1. FIG. 2 is an exploded perspective view of the spout unit 12.

In the description of the present embodiment, as shown in FIG. 1, a direction perpendicular to a horizontal plane on which the package 10 is erected is defined as the vertical direction of the package 10. The long direction of the package 10, observed downward, is defined as the left-right direction of the package 10. The short direction of the package 10 is defined as the front-rear direction of the package 10. The vertical direction, the left-right direction, and the front-rear direction of the package 10 are orthogonal to each other. However, the vertical direction, the left-right direction, and the front-rear direction of the package 10 in the description of the present embodiment may not match the vertical direction, the left-right direction, and the front-rear direction in the space where the package 10 is actually used. Note that in the description of the present embodiment, the vertical direction, the left-right direction, and the front-rear direction mean the vertical direction, the left-right direction, and the front-rear direction of the package 10 shown in FIG. 1 unless otherwise specified.

The contents-filled package 1 includes the package 10 and a food 200. As shown in FIG. 1, the package 10 includes the spout unit 12 and a package main body 100. The package main body 100 is a pouch that accommodates the food 200. In the contents-filled package 1 shown in FIG. 1, the food 200 is accommodated in the package main body 100. The food 200 is a product ingested by humans through the mouth. Therefore, the food 200 also includes medicines. The food 200 only has to be a fluid. That is, the food 200, which may be any of a liquid-like or gel-like product. The

package main body 100 has flexibility. For that reason, when a human holds the package main body 100, the package main body 100 becomes deformed. When the package main body 100 is observed downward, a length L1 of the package main body 100 in the left-right direction is longer than a length L2 of the package main body 100 in the front-rear direction.

As shown in FIG. 2, the spout unit 12 includes a cap 20 and a spout 40. The material of the spout unit 12 is an elastic material. The material of the spout unit 12 is a resin, for example.

The cap 20 includes a cap main body 22 and cap projections 24L and 24R. The cap main body 22 has a tubular shape. More specifically, the cap main body 22 has an upper surface, a lower surface, and a side surface. The upper surface and the lower surface have an elliptical shape. The cap main body 22 is provided with a hole H. The hole H extends upward from the lower surface of the cap main body 22. When the hole H is observed upward, the hole H has a circular shape. However, the hole H does not penetrate the cap main body 22 upward.

The cap main body 22 as described above has a top surface S0, a cap main body inner circumferential surface S1, and a cap main body outer circumference surface S2. The cap main body inner circumferential surface S1 demarcates the hole H. The hole H has a cylindrical shape. The cap main body inner circumferential surface S1 is provided with a screw groove 26. The top surface S0 is connected to the top end of the cap main body inner circumferential surface S1. The top surface S0 is directed downward. The cap main body 22 has an elliptical cylindrical shape. The cap main body outer circumference surface S2 is subjected to knurling, not shown.

The cap projections 24L and 24R project downward from the lower end portion of the cap main body 22. When the cap projections 24L and 24R are observed upward,

the cap projections 24L and 24R are adjacent to the hole H. The position and shape of the cap projections 24L and 24R will be described later.

The spout 40 is fixed to the package main body 100. The spout 40 includes a spout main body 42, spout projections 44L and 44R, flanges 48 and 50, and weld portions 52L and 52R.

The spout main body 42 has a cylindrical shape that has a center axis Ax extending upward from the package main body 100. Note that the center axis Ax also matches the center axis of the hole H. The spout main body 42 has a spout main body inner circumferential surface S11 and a spout main body outer circumference surface S12. Near the top end of the spout main body outer circumference surface S12, a screw thread 46, which the cap main body inner circumferential surface S1 is engaged with the screw groove 26, is provided. The user sucks at the top end of the spout main body 42, and then the food 200 in the package main body 100 is sucked from the lower end of the spout main body 42.

The flanges 48 and 50 have a plate shape that has an upper surface and a lower surface. The upper surface and the lower surface of the flanges 48 and 50 have a rectangular shape. The long sides of the upper surface and the lower surface of the flanges 48 and 50 extend in the left-right direction. The short sides of the upper surface and the lower surface of the flanges 48 and 50 extend in the front-rear direction. The flange 48 is located below the screw thread 46. The flange 50 is located below the flange 48. The spout main body 42 vertically penetrates the flange 48. Thus, the spout main body 42 projects upward from the flange 48. The spout main body 42 projects downward from the flange 50.

The weld portions 52L and 52R have a plate shape that has a front surface and a rear surface. The front surface and the rear surface of the weld portions 52L and 52R

have a rectangular shape. The upper surface of the weld portion 52L is joined to the flange 50. The right surface of the weld portion 52L is joined to the spout main body 42. The upper surface of the weld portion 52R is joined to the flange 50. The left surface of the weld portion 52R is joined to the spout main body 42.

When the spout projection 44L is observed downward, the spout projection 44L projects from the spout main body 42 in a direction apart from the center axis Ax. In the present embodiment, the spout projection 44L projects from the left end portion of the spout main body 42 in the left direction. The spout projection 44L projects upward from the flange 48. The spout projection 44L as described above is located below the screw thread 46.

When the spout projection 44R is observed downward, the spout projection 44R projects from the spout main body 42 in a direction apart from the center axis Ax. In the present embodiment, the spout projection 44R projects from the right end portion of the spout main body 42 in the right direction. The spout projection 44R projects upward from the flange 48. The spout projection 44R as described above is located below the screw thread 46. The position and shape of the spout projections 44L and 44R will be described later.

The spout 40, as described above, is fixed to the package main body 100. More specifically, before the spout 40 is attached to the package main body 100, an upper end portion 102 of the package main body 100 is opened. Therefore, the upper end portion 102 includes an upper end portion front piece 102F and an upper end portion rear piece 102B. The upper end portion front piece 102F and the upper end portion rear piece 102B then sandwich the weld portions 52L and 52R in the front-rear direction. The upper end portion front piece 102F is welded to the upper end portion rear piece 102B. Thus, the package main body 100 is sealed. At this time, the upper

end portion front piece 102F and the upper end portion rear piece 102B are joined to the weld portions 52L and 52R. Thus, the spout 40 is fixed to the package main body 100. The upper part of the spout main body 42, the spout projections 44L and 44R, and the flanges 48 and 50 are exposed to the outside of the package main body 100.

Here, the positions of the cap projections 24L and 24R and the spout projections 44L and 44R will be described with reference to the drawings. FIG. 3 is a diagram of the cap 20 and the spout 40 observed in the front-rear direction when the spout 40 is opened. FIG. 4 is a diagram of the cap 20 and the spout 40 observed in the front-rear direction and the vertical direction when the spout 40 is closed. In FIGS. 3 and 4, the screw thread 46 and the screw groove 26 are omitted. Note that when the cap projection 24R and the cap projection 24L are observed downward, the position of the cap projection 24R and the position of the cap projection 24L are in point symmetry with the center axis Ax. When the spout projection 44R and the spout projection 44L are observed downward, the position of the spout projection 44R and the position of the spout projection 44L are in point symmetry with the center axis Ax. Therefore, the position of the cap projection 24R and the position of the spout projection 44R are described, while the descriptions of the position of the cap projection 24L and the position of the spout projection 44L are omitted.

The rotation direction of the cap main body 22 when the cap 20 closes the spout 40 is defined as a closing rotation direction R1. The closing rotation direction R1 is a clockwise direction when the cap 20 is observed downward. The rotation direction of the cap main body 22 when the cap main body 22 opens the spout main body 42 is defined as an opening rotation direction R2. The opening rotation direction R2 is a counterclockwise direction when the cap 20 is observed downward.

As shown in FIG. 3, when the cap 20 is attached to the spout 40, the cap 20 is

disposed on the spout 40. The spout main body 42 is inserted into the hole H of the cap 20, and the cap 20 is rotated in the closing rotation direction R1. Thus, as shown in FIG. 4, closing the spout 40 with the cap 20 is completed. After completion of closing the spout 40 with the cap 20, a left-right length L11 of the cap main body 22 observed downward is longer than a front-rear length L12 of the cap main body 22. That is, in the present embodiment, the major axis of the upper surface of the cap main body 22 is substantially parallel to the left-right direction. The minor axis of the upper surface of the cap main body 22 is substantially parallel to the front-rear direction.

At this time, as shown in FIG. 4, a straight line passing through the center axis Ax of the spout main body 42 observed downward and extending in the left-right direction is defined as a reference straight line L100. Here, the reference straight line L100 rotated at an angle of 50° about the center axis Ax in the closing rotation direction R1 is defined as a first straight line L101. The reference straight line L100 rotated at an angle of 50° about the center axis Ax in the opening rotation direction R2 (the direction opposite to the closing rotation direction) is defined as a second straight line L102.

A region demarcated by the first straight line L101 and the second straight line L102 and including the reference straight line L100 is defined as a left region AL and a right region AR. The left region AL is positioned on the left of the right region AR in the left-right direction. A region demarcated by the first straight line L101 and the second straight line L102 and not including the reference straight line L100 is defined as a front region AF and a rear region AB. The front region AF is positioned in front of the rear region AB in the front-rear direction.

At this time, the spout projection 44L is positioned in the left region AL. In the present embodiment, the spout projection 44L is positioned on the reference straight line L100. The spout projection 44R is positioned in the right region AR. In the present

embodiment, the spout projection 44R is positioned on the reference straight line L100.

At this time, the cap projection 24L is positioned in the left region AL. In the present embodiment, the position of the cap projection 24L is displaced from the position of the spout projection 44L in the closing rotation direction R1. The cap projection 24L contacts the spout projection 44L. The cap projection 24R is positioned in the right region AR. In the present embodiment, the position of the cap projection 24R is displaced from the position of the spout projection 44R in the closing rotation direction R1. The cap projection 24R contacts the spout projection 44R.

However, at this time, the spout projection in contact with the cap projection 24L or the cap projection 24R is not provided in either the front region AF or the rear region AB.

Next, the shapes of the cap projections 24L and 24R and the shapes of the spout projections 44L and 44R will be described with reference to the drawings.

FIG. 5 shows a diagram of the cap projection 24R observed in a third direction d3 and a diagram of the cap projection 24R observed in the opening rotation direction R2. FIG. 6 shows a diagram of the spout projection 44R observed in the third direction d3 and a diagram of the spout projection 44R observed in the opening rotation direction R2. Note that the shape of the cap projection 24R is the same as the shape of the cap projection 24L. The shape of the spout projection 44R is the same as the shape of the spout projection 44L. Therefore, the shape of the cap projection 24R and the shape of the spout projection 44R will be described, while the shape of the cap projection 24L and the shape of the spout projection 44L are omitted.

Here, as shown in FIG. 4, when the cap 20 rotates in the closing rotation direction R1 to close the spout 40, the cap projection 24R moves from a contact start position (position at which the cap projection 24R begins to contact the spout projection

44R (FIG. 7B)) to a contact complete position (position at which the cap projection 24R ends the contact with the spout projection 44R (FIG. 7D)). In this process, the direction of the spout projection 44R toward the cap projection 24R when the cap projection 24R moves to a middle position (FIG. 7C) between the contact start position and the contact complete position is defined as a first direction d1. In the present embodiment, the first direction d1 is a direction apart from the center axis Ax. That is, the first direction d1 is a so-called radial direction of the spout main body 42. On the other hand, at the middle position, a direction from the cap projection 24R to the spout projection 44R is defined as a second direction d2. In the present embodiment, the second direction d2 is a direction toward the center axis Ax. That is, the second direction d2 is the reverse direction of the first direction d1. In the following description, the first direction d1 and the second direction d2 are appropriately collectively referred to as a spout radial direction. Similarly, the closing rotation direction R1 and the opening rotation direction R2 are collectively referred to as a cap rotation direction.

A direction orthogonal to the first direction d1 and the closing rotation direction R1 is defined as the third direction d3 and a fourth direction d4. In the present embodiment, the third direction d3 is directed downward. The fourth direction d4 is directed upward. In the following description, the third direction d3 and the fourth direction d4 are appropriately collectively referred to as a spout vertical direction.

First, the shape of the cap projection 24R will be described. As shown in FIG. 5, a length L21 of the cap projection 24R in the spout vertical direction is shorter than a length L22 of the cap projection 24R in the cap rotation direction. A length L23 of the cap projection 24R in the spout radial direction is shorter than the length L22 of the cap projection 24R in the cap rotation direction.

The cap projection 24R includes a first section A1, a second section A2, and a

fifth section A5. The second section A2, the fifth section A5, and the first section A1 are arranged in this order in the closing rotation direction R1. Therefore, the first section A1 is positioned in front of the second section A2 in the closing rotation direction R1.

The inclination of the outer edge of the cap projection 24R in the first section A1 is gentler than the inclination of the outer edge of the cap projection 24R in the second section A2. More specifically, in FIG. 5, the outer edge of the cap projection 24R in the first section A1 extends in the first direction d1, as extending toward the closing rotation direction R1. Accordingly, a direction in which the normal of the outer edge of the cap projection 24R in the first section A1 is apart from the cap projection 24R has a component in the closing rotation direction R1 and a component in the second direction d2. In the present embodiment, the outer edge of the cap projection 24R in the first section A1 projects toward the second direction d2.

On the other hand, in FIG. 5, the outer edge of the cap projection 24R in the second section A2 extends in the first direction d1, as extending toward the opening rotation direction R2 (the direction opposite to the closing rotation direction R1). Accordingly, the direction in which the normal of the outer edge of the cap projection 24R in the second section A2 is apart from the cap projection 24R has a component in the opening rotation direction R2 and a component in the second direction d2. In the present embodiment, in the second section A2, a convex portion that has an arc shape is combined with a part extending from the end of the convex portion in the opening rotation direction R2 toward the first direction d1, and thus, the outer edge of the cap projection 24R is demarcated.

A length l1 of the first section A1 in the cap rotation direction is longer than a length l2 of the second section A2 in the cap rotation direction. From the structure of

the cap projection 24R described above, the inclination of the outer edge of the cap projection 24R in the first section A1 is gentler than the inclination of the outer edge of the cap projection 24R in the second section A2.

In FIG. 5, the outer edge of the cap projection 24R in the fifth section A5 has a shape parallel to the closing rotation direction R1. Accordingly, the direction in which the normal of the outer edge of the cap projection 24R in the fifth section A5 is apart from the cap projection 24R extends in the second direction d2. In the present embodiment, the outer edge of the cap projection 24R in the fifth section A5 observed in the third direction d3 has a straight line shape.

In FIG. 5, the cap projection 24R observed in the opening rotation direction R2 has a rectangular shape that has two sides extending in the spout radial direction and two sides extending in the spout vertical direction. However, in FIG. 5, an angle formed by the second direction d2 and the third direction d3 in the cap projection 24R has a beveled shape. Similarly, an angle formed by the second direction d2 and the fourth direction d4 in the cap projection 24R has a beveled shape.

Next, the shape of the spout projection 44R will be described. As shown in FIG. 6, the spout projection 44R observed in the third direction d3 has a rectangular shape that has two sides extending in the cap rotation direction and two sides extending in the spout radial direction. In FIG. 6, an angle formed by the first direction d1 and the closing rotation direction R1 in the spout projection 44R has a beveled shape. Similarly, an angle formed by the first direction d1 and the opening rotation direction R2 in the spout projection 44R has a beveled shape.

The spout projection 44R observed in the opening rotation direction R2 has a rectangular shape that has two sides extending in the spout radial direction and two sides extending in the spout vertical direction. However, in FIG. 6, an angle formed by

the first direction d1 and the fourth direction d4 in the spout projection 44R has a beveled shape.

Next, the operation of the cap 20 and the spout 40 when the cap 20 closes the spout 40 will be described with reference to the drawings. FIGS. 7A to 7D are diagrams of the cap projection 24R and the spout projection 44R observed in the third direction d3.

As shown in FIG. 3, when the cap 20 closes the spout 40, the cap 20 is disposed above the spout 40. The spout main body 42 is inserted into the hole H of the cap 20, and the cap 20 rotates in the closing rotation direction R1. The cap main body 22 rotates in the closing rotation direction R1, and the cap projection 24R crosses the spout projection 44R. At this time, the closing of the spout 40 by the cap 20 is completed.

More specifically, as shown in FIG. 7A, when the cap 20 rotates in the closing rotation direction R1, the cap projection 24R travels in the closing rotation direction R1. As shown in FIG. 7B, the outer edge of the cap projection 24R in the first section A1 contacts the spout projection 44R. At this time, the spout projection 44R pushes the cap projection 24R in the opening rotation direction R2. For that reason, the cap 20 receives force against the rotation in the closing rotation direction R1. The spout projection 44R pushes the cap projection 24R in the first direction d1, and the cap projection 24R pushes the spout projection 44R in the second direction d2. For that reason, the cap 20 and the spout 40 are elastically deformed such that the spout projection 44R is displaced in the second direction d2 and the cap projection 24R is displaced in the first direction d1.

As shown in FIG. 7C, when the cap 20 further rotates in the closing rotation direction R1, the outer edge of the cap projection 24R in the fifth section A5 contacts

the spout projection 44R. At this time, the cap projection 24R receives force in the opening rotation direction R2 due to friction with the spout projection 44R. However, in FIG. 7C, the magnitude of force received by the cap projection 24R in the opening rotation direction R2 is smaller than the magnitude of force received by the cap projection 24R in the opening rotation direction R2 in FIG. 7B.

As shown in FIG. 7D, when the cap 20 further rotates in the closing rotation direction R1, the outer edge of the cap projection 24R in the second section A2 contacts the spout projection 44R. At this time, the spout projection 44R pushes the cap projection 24R in the closing rotation direction R1. For that reason, the cap 20 receives force that promotes the rotation in the closing rotation direction R1. This eliminates elastic deformation produced in the cap 20 and the spout 40. However, in FIG. 7D, the magnitude of force received by the cap projection 24R in the closing rotation direction R1 is greater than the magnitude of force received by the cap projection 24R in the opening rotation direction R2 in FIG. 7B. The cap 20 rotates in the closing rotation direction R1, and the cap projection 24R crosses the spout projection 44R. At this time, the top end of the spout main body 42 contacts the top surface S0 of the cap main body 22. Thus, the cap 20 is not possible to rotate further in the closing rotation direction R1. As a result, the operation of the cap 20 closing the spout 40 is completed.

Effects

According to the spout unit 12 of the present embodiment, it is possible to reduce the chance of the cap 20 becoming loose. More specifically, in the spout unit 12, the cap 20 is rotated in the closing rotation direction R1 to cause the cap projection 24R to cross the spout projection 44R. At this time, the closing of the spout 40 by the cap 20 is completed. Therefore, in the case in which the cap 20 rotates in the opening rotation direction R2, the cap projection 24R contacts the spout projection 44R. For that reason,

the spout projection 44R suppresses the cap 20 from rotating in the opening rotation direction R2. As a result, with the spout unit 12, it is possible to reduce the chance of the cap 20 becoming loose.

With the spout unit 12, the user can recognize the completion of closing the spout 40 by the cap 20. More specifically, in the spout unit 12, the cap 20 is rotated in the closing rotation direction R1 to cause the cap projection 24R to cross the spout projection 44R. At this time, the closing of the spout 40 by the cap 20 is completed. When the cap projection 24R crosses the spout projection 44R, the cap 20 and the spout 40 generate a clicking feeling. This clicking feeling enables the user to recognize the completion of closing the spout 40 by the cap 20.

As shown in FIG. 1, with the spout unit 12, when the package main body 100 attached with the spout unit 12 is observed downward, the long direction of the cap 20 substantially matches the long direction of the package main body 100. More specifically, in FIG. 1, the length L1 of the package main body 100 in the left-right direction is longer than the length L2 of the package main body 100 in the front-rear direction. In FIG. 1, when the closing of the spout 40 by the cap 20 is completed, the length of the cap main body 22 in the left-right direction is longer than the length of the cap main body 22 in the front-rear direction. That is, at this time, the long direction of the cap 20 substantially matches the long direction of the package main body 100. As a result, the cap 20 does not easily project in either the front direction or the rear direction from the package main body 100.

When the spout unit 12 is observed downward, the spout projection 44R is positioned in the right region AR (FIG. 4). Thus, the spout projection 44R does not easily contact the user's mouth. Specifically, in FIG. 4, the spout unit 12 is not provided with the projection that contacts the cap projection 24R in either the front

region AF or the rear region AB. For that reason, the projection does not further easily contact the user's mouth.

In FIG. 4, in the spout unit 12, the length of the spout vertical direction of the spout unit 12 can be shortened. More specifically, in FIG. 5, in the spout unit 12, the length L21 of the cap projection 24R in the spout vertical direction is shorter than the length L22 of the cap projection 24R in the spout rotation direction. Thus, it is possible to shorten the length of the spout unit 12 in the spout vertical direction. However, the cap projection 24R is not easily elastically deformed when the cap projection 24R contacts the spout projection 44R. For that reason, abrasion easily occurs in the cap projection 24R. From the viewpoint of abrasion in the cap projection 24R, the length of the cap projection 24R in the spout vertical direction is preferably long.

The package main body 100 is formed to accommodate the food 200. When the package main body 100 accommodates the food 200, typically, the food 200 is consumed shortly after the package main body 100 is opened. For that reason, the frequency of opening and closing the cap 20 is small. As a result, even though the length of the spout unit 12 in the vertical direction is short, the abrasion in the cap projection 24R does not easily become a problem. From the reasons described above, in the spout unit 12, it is possible to shorten the length of the spout unit 12 in the spout vertical direction.

In the spout unit 12, the cap 20 is rotated in the closing rotation direction R1 to cause the cap projection 24R to cross the spout projection 44R. At this time, the top end of the spout main body 42 contacts the top surface S0 of the cap main body 22. Thus, the occurrence of overrun, which is a phenomenon in which the cap 20 rotates too much in the closing rotation direction R1.

In the spout unit 12, the user easily closes the spout 40 with the cap 20. In the

spout unit 12, a clicking feeling easily occurs. More specifically, as shown in FIG. 5, the first section A1 of the cap projection 24R is positioned in front of the second section A2 in the closing rotation direction R1. In FIG. 5, the outer edge of the cap projection 24R in the first section A1 extends in the first direction d1, as extending toward the closing rotation direction R1. In FIG. 5, the outer edge of the cap projection 24R in the second section A2 extends in the first direction d1, as extending toward the opening rotation direction R2 (the direction opposite to the closing rotation direction R1). However, the length l1 of the first section A1 in the closing rotation direction R1 is longer than the length l2 of the second section A2 in the closing rotation direction R1. Thus, the inclination of the outer edge of the cap projection 24R in the first section A1 is gentler than the inclination of the outer edge of the cap projection 24R in the second section A2.

The cap projection 24R and the spout projection 44R have the structures as described above, and thus, as shown in FIG. 7B, the outer edge of the cap projection 24R in the first section A1 has a small force against the rotation in the closing rotation direction R1 of the cap 20, which is produced when contacting the spout projection 44R. Accordingly, the user easily closes the spout 40 with the cap 20. As shown in FIG. 7C and FIG. 7D, the elastic deformation in the cap 20 and the spout 40 is suddenly eliminated when the outer edge of the cap projection 24R in the fifth section A5 contacts the spout projection 44R. Thus, a large clicking feeling occurs. As described above, in the spout unit 12, the user easily closes the spout 40 with the cap 20. A clicking feeling is easily generated.

With the spout unit 12, the user easily closes the spout 40 with the cap 20 for the reasons below as well. More specifically, in the spout projection 44R observed in the third direction d3, an angle formed by the first direction d1 and the closing rotation

direction R1 has a beveled shape. Similarly, an angle formed by the first direction d1 and the opening rotation direction R2 has a beveled shape. This makes the cap projection 24R not easily hang the spout projection 44R. As a result, with the spout unit 12, the user easily closes the spout 40 with the cap 20.

Modification

In the following, a spout unit 12a according to another embodiment (modification) will be described with reference to the drawings. FIG. 8 shows diagrams of a spout projection 44R observed in the third direction d3 and the spout projection 44R observed in the opening rotation direction R2. FIG. 9 shows diagrams of a cap projection 24R observed in the third direction d3 and the cap projection 24R observed in the opening rotation direction R2.

The spout unit 12a is different from the spout unit 12 in the shape of the cap projection 24R and the shape of the spout projection 44R. In the following, these differences will be described.

First, the shape of the spout projection 44R will be described. As shown in FIG. 8, a length L31 of the spout projection 44R in the spout radial direction is shorter than a length L32 of the spout projection 44R in the cap rotation direction. A length L33 of the spout projection 44R in the spout vertical direction is shorter than the length L32 of the spout projection 44R in the cap rotation direction.

The spout projection 44R includes a third section A3, a fourth section A4, and a sixth section A6. The third section A3, the sixth section A6, and the fourth section A4 are arranged in this order in the closing rotation direction R1. Therefore, the fourth section A4 is positioned in front of the third section A3 in the closing rotation direction R1.

The inclination of the outer edge of the spout projection 44R in the third

section A3 is gentler than the inclination of the outer edge of the spout projection 44R in the fourth section A4. More specifically, in FIG. 8, the outer edge of the spout projection 44R in the third section A3 extends in the second direction d2, as extending toward the opening rotation direction R2 (the direction opposite to the closing rotation direction R1). Accordingly, the direction in which the normal of the outer edge of the spout projection 44R in the third section A3 is apart from the spout projection 44R has a component in the opening rotation direction R2 and a component in the first direction d1. In the present embodiment, the outer edge of the spout projection 44R in the third section A3 projects toward the first direction d1.

On the other hand, in FIG. 8, the outer edge of the spout projection 44R in the fourth section A4 extends in the second direction d2, as extending toward the closing rotation direction R1. Accordingly, the direction in which the normal of the outer edge of the spout projection 44R in the fourth section A4 is apart from the spout projection 44R has a component in the closing rotation direction R1 and a component in the first direction d1. In the present embodiment, in the fourth section A4, the convex portion that has an arc shape is combined with a part extending in the second direction d2 from the end of the convex portion in the closing rotation direction R1, and thus, the outer edge of the spout projection 44R is demarcated.

A length l3 of the third section A3 in the cap rotation direction is longer than a length l4 of the fourth section A4 in the cap rotation direction.

In FIG. 8, the outer edge of the spout projection 44R in the sixth section A6 is parallel to the cap rotation direction. Accordingly, the normal of the outer edge of the spout projection 44R in the sixth section A6 extends in the spout radial direction. In the present embodiment, the outer edge in the sixth section A6 of the spout projection 44R observed in the third direction d3 has a straight line shape.

The spout projection 44R observed in the opening rotation direction R2 has a rectangular shape that has two sides extending in the spout radial direction and two sides extending in the spout vertical direction. However, an angle formed by the first direction d1 and the fourth direction d4 in the spout projection 44R has a beveled shape.

Next, the shape of the cap projection 24R will be described. As shown in FIG. 9, the cap projection 24R observed in the third direction d3 has a rectangular shape that has two sides extending in the cap rotation direction and two sides extending in the spout radial direction. In FIG. 9, an angle formed by the second direction d2 and the closing rotation direction R1 in the cap projection 24R has a beveled shape. Similarly, an angle formed by the second direction d2 and the opening rotation direction R2 in the cap projection 24R has a beveled shape.

The cap projection 24R observed in the opening rotation direction R2 has a rectangular shape that has two sides extending in the spout radial direction and two sides extending in the spout vertical direction. However, an angle formed by the second direction d2 and the third direction d3 in the cap projection 24R has a beveled shape. Similarly, an angle formed by the second direction d2 and the fourth direction d4 in the cap projection 24R has a beveled shape. The other structures of the spout unit 12a are the same as those of the spout unit 12. For that reason, the descriptions of the spout unit 12a and the other structures are omitted. The spout unit 12a is possible to exert the same operation and effect as the spout unit 12.

Other embodiments

The spout unit according to the present embodiment is not limited to the spout units 12 and 12a. The spout unit according to the present embodiment can be appropriately modified within the gist of the disclosure. The structure of the spout unit 12 and the structure of the spout unit 12a may be appropriately combined.

Note that in the cap projection 24R or the cap projection 24L of the spout unit 12, the fifth section A5 does not necessarily have to be provided. In the spout projection 44R or the spout projection 44L of the spout unit 12a, the sixth section A6 does not necessarily have to be provided.

Note that in the spout units 12 and 12a, at least one of the cap projections 24L and 24R only has to be provided. Similarly, at least one of the spout projections 44L and 44R only has to be provided.

Note that in the spout units 12 and 12a, the first direction d1 may be directed upward, and the second direction d2 may be directed downward. The first direction d1 may be directed downward, and the second direction d2 may be directed upward.

Note that the upper surface and the lower surface of the cap main body 22 may have a shape other than an elliptical shape, such as a rectangular shape, for example.

Note that in the spout units 12 and 12a, the cap main body inner circumferential surface S1 may be provided with a screw thread. At this time, the spout main body 42 is provided with a screw groove.

Note that when the package attached with the spout unit according to the embodiment is observed in the third direction d3, the cap projection 24L may be provided with a projection that does not contact the cap projection 24R in the front region AF or the rear region AB.

Note that the number of the flanges 48 may be three or more. Similarly, the number of the flanges 50 may be three or more.

Note that the package main body 100 may be formed to accommodate contents other than the food 200. As an example of contents other than food, a detergent is named.

In the foregoing embodiments, the spout projection 44L and the spout

projection 44R project upward from the flange 48. However, a gap may be provided between the flange 48 and the spout projections 44L and 44R, which project from the spout main body 42.

The foregoing detailed description has been presented for the purposes of illustration and description. Many modifications and variations are possible in light of the above teaching. It is not intended to be exhaustive or to limit the subject matter described herein to the precise form disclosed. Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims appended hereto.

Unless the context requires otherwise, where the terms “comprise”, “comprises”, “comprised” or “comprising” are used in this specification (including the claims) they are to be interpreted as specifying the presence of the stated features, integers, steps or components, but not precluding the presence of one or more other features, integers, steps or components, or group thereof.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS

1. A spout unit comprising a cap and a spout, wherein

the cap includes a cap main body and a cap projection,

the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface,

the cap main body inner circumferential surface is provided with a first screw thread or a first screw groove,

the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection,

the spout main body has a cylindrical shape,

a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed,

the spout main body is provided with a second screw groove engaged with the first screw thread or a second screw thread engaged with the first screw groove,

the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout,

when the spout is closed, a length of the cap main body in a long direction of the package main body to which the spout is fixed is longer than a length of the cap main body in a short direction of the package main body, and a length of the cap projection in the vertical direction of the package main body to which the spout is fixed is shorter than a length of the cap projection in a cap rotation direction,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the spout projection is positioned in a left region or a right region,

the left region and the right region are demarcated by a first straight line and a second straight line, and the left region and the right region include a reference straight line,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the reference straight line is orthogonal to the center axis and extends in the long direction of the package main body,

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the first straight line is the reference straight line rotated at an angle of 50° about the center axis in the closing rotation direction, and

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the second straight line is the reference straight line rotated at an angle of 50° about the center axis in a direction opposite to the closing rotation direction.

2. The spout unit according to claim 1, wherein

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, a projection that contacts the cap projection is not provided in either a front region or a rear region, and

the front region and the rear region are demarcated by the first straight line and the second straight line, and the front region and the rear region do not include the reference straight line.

3. The spout unit according to claim 1 or 2, wherein

the spout is formed to be fixed to the package main body that accommodates a

food.

4. The spout unit according to claim 1 or 2, wherein

the cap projection projects downward from a lower end portion of the cap main body in the vertical direction of the package main body, and

when the spout fixed to the package main body is observed downward in the vertical direction of the package main body, the spout projection projects from the spout main body in a direction apart from the center axis.

5. The spout unit according to claim 1 or 2, wherein

the cap and the spout main body are formed such that when the cap rotates in the closing rotation direction and the cap projection crosses the spout projection, a top end of the spout main body contacts a top surface of the cap main body.

6. A package comprising the spout unit according to claim 1 or 2 and the package main body.

7. A contents-filled package comprising the package according to claim 6 and contents accommodated in the package main body.

8. A spout unit comprising a cap and a spout, wherein

the cap includes a cap main body and a cap projection,

the cap main body has a cap main body inner circumferential surface and a cap main body outer circumference surface,

the cap main body inner circumferential surface is provided with a first screw

thread or a first screw groove,

the spout is formed to be fixed to a package main body, and the spout includes a spout main body and a spout projection,

the spout main body has a cylindrical shape,

a center axis of the cylindrical shape extends in a vertical direction of the package main body to which the spout is fixed,

the spout main body is provided with a second screw groove engaged with the first screw thread or a second screw thread engaged with the first screw groove,

the cap projection and the spout projection are formed such that when the cap rotates in a closing rotation direction, the cap projection crosses the spout projection to close the spout,

the cap projection and the spout projection have configuration A or configuration B below,

configuration A:

the cap projection includes a first section and a second section,

the first section is positioned in front of the second section in the closing rotation direction,

when the cap projection is observed in a direction orthogonal to a first direction and the closing rotation direction, an outer edge of the cap projection in the first section extends in the first direction, as extending toward the closing rotation direction,

an outer edge of the cap projection in the second section extends in the first direction, as extending toward a direction opposite to the closing rotation direction,

the first direction is a direction from the spout projection to the cap projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which

the cap rotates in the closing rotation direction to close the spout, and

a length of the first section in a cap rotation direction is longer than a length of the second section in the cap rotation direction, and

configuration B:

the spout projection includes a third section and a fourth section,

the fourth section is positioned in front of the third section in the closing rotation direction,

when the spout projection is observed in a direction orthogonal to a second direction and the closing rotation direction, an outer edge of the spout projection in the third section extends in the second direction, as extending toward a direction opposite to the closing rotation direction,

an outer edge of the spout projection in the fourth section extends in the second direction, as extending in the closing rotation direction,

the second direction is a direction from the cap projection to the spout projection when the cap projection is at a middle position between a contact start position to the spout projection and a contact complete position to the spout projection during which the cap rotates in the closing rotation direction to close the spout, and

a length of the third section in a cap rotation direction is longer than a length of the fourth section in the cap rotation direction.

9. The spout unit according to claim 8, wherein

the cap projection and the spout projection have configuration A,

the cap projection further includes a fifth section,

the second section, the fifth section, and the first section are arranged in this order in the closing rotation direction, and

when the cap projection is observed in a direction orthogonal to the first direction and the closing rotation direction, an outer edge of the cap projection in the fifth section is parallel to the closing rotation direction.

10. The spout unit according to claim 9, wherein

when the spout projection is observed in a direction orthogonal to the first direction and the closing rotation direction, the spout projection has two sides extending in the closing rotation direction and two sides extending in the first direction, and

in the spout projection, two angles formed by the first direction and the cap rotation direction have a beveled shape.

11. The spout unit according to claim 8, wherein

the cap projection and the spout projection have configuration B,

the spout projection further includes a sixth section,

the third section, the sixth section, and the fourth section are arranged in this order in the closing rotation direction, and

when the spout projection is observed in a direction orthogonal to the second direction and the closing rotation direction, an outer edge of the spout projection in the sixth section is parallel to the closing rotation direction.

12. The spout unit according to claim 11, wherein

when the cap projection is observed in the direction orthogonal to the second direction and the closing rotation direction, the cap projection has two sides extending in the closing rotation direction and two sides extending in the second direction, and

in the cap projection, two angles formed by the second direction and the cap

rotation direction have a beveled shape.

13. A package comprising the spout unit according to any one of claims 8 to 12 and the package main body.

14. A contents-filled package comprising the package according to claim 13 and contents accommodated in the package main body.

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FIG. 1

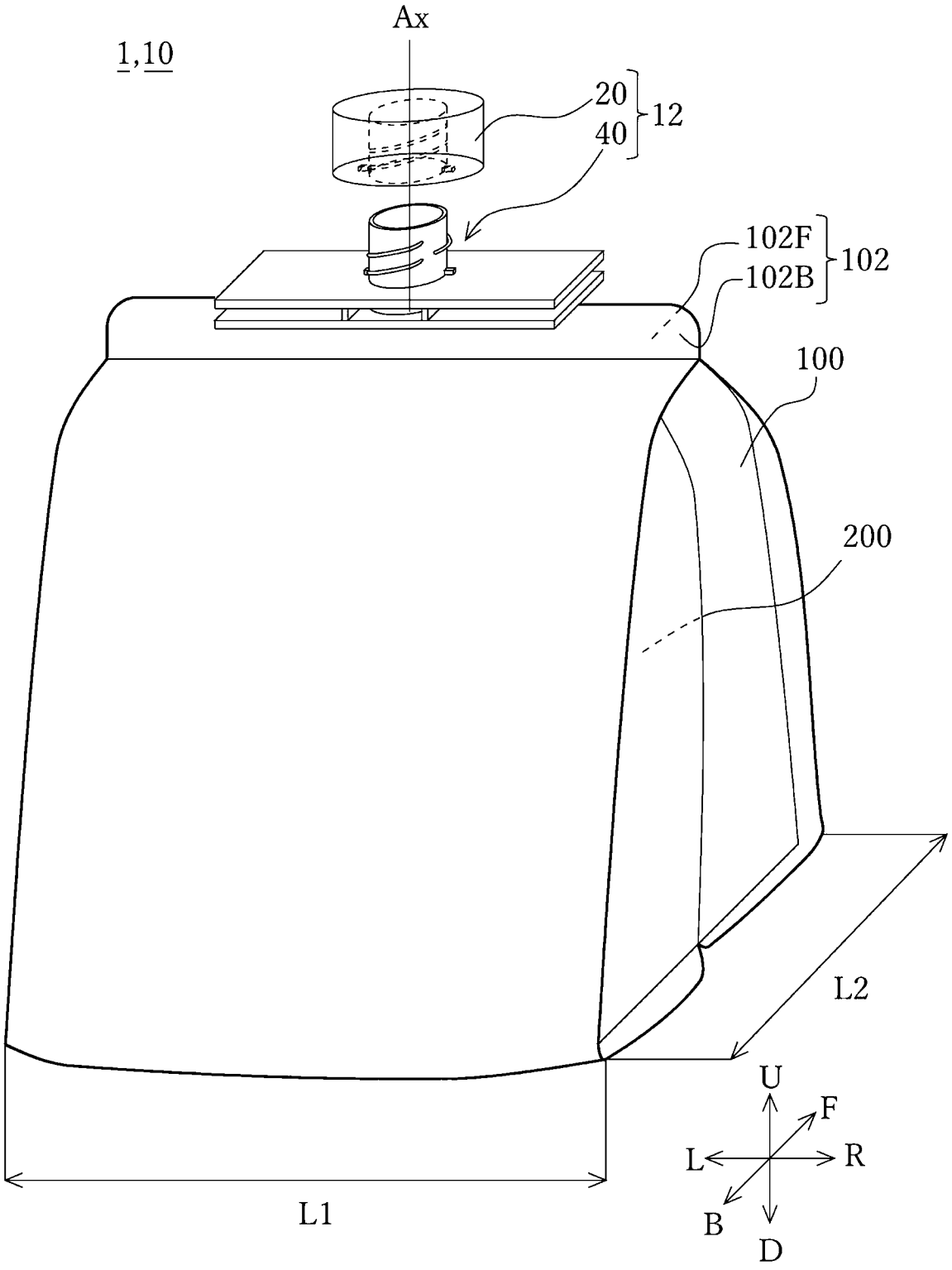

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FIG. 2

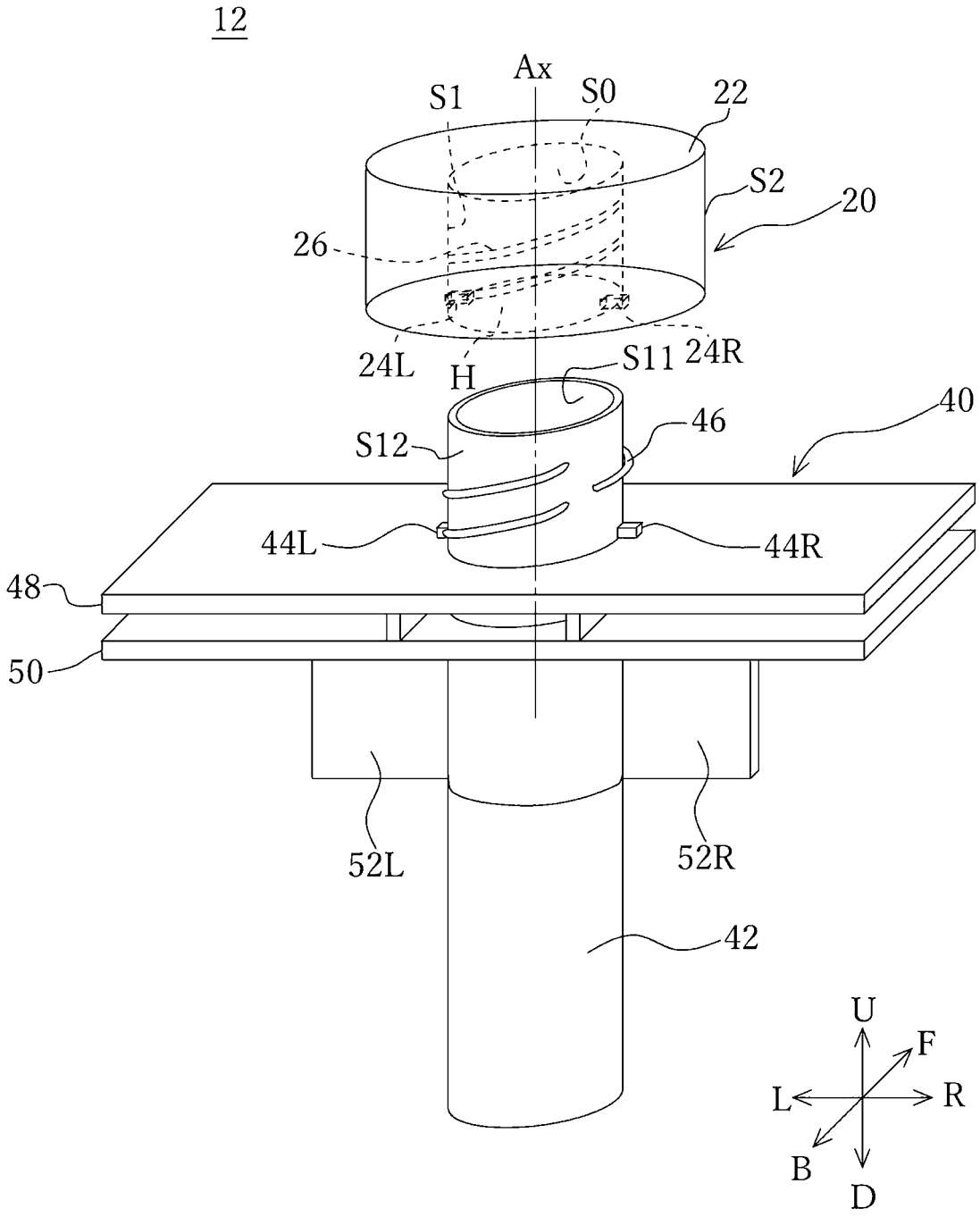

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FIG. 3

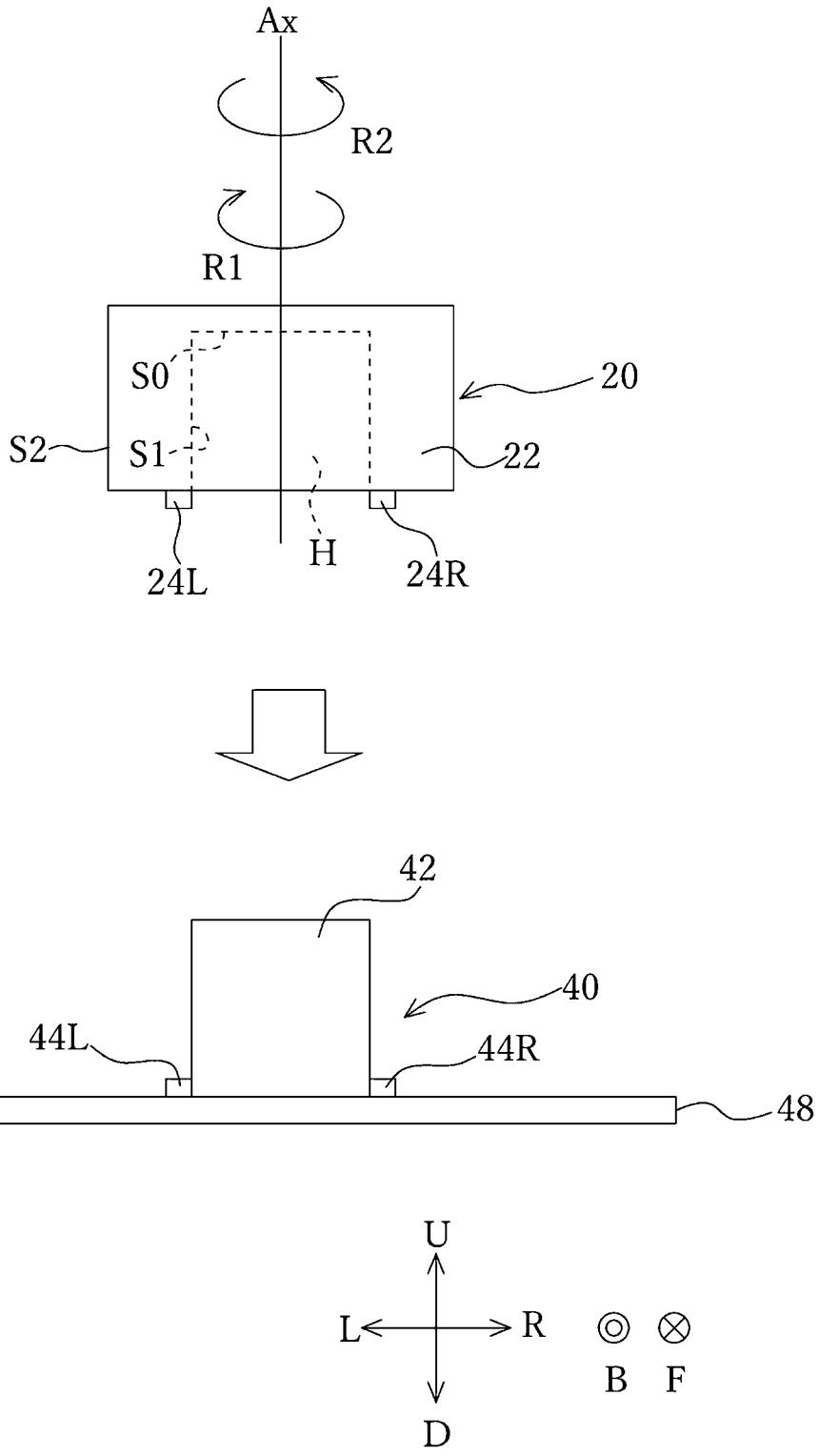

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FIG. 4

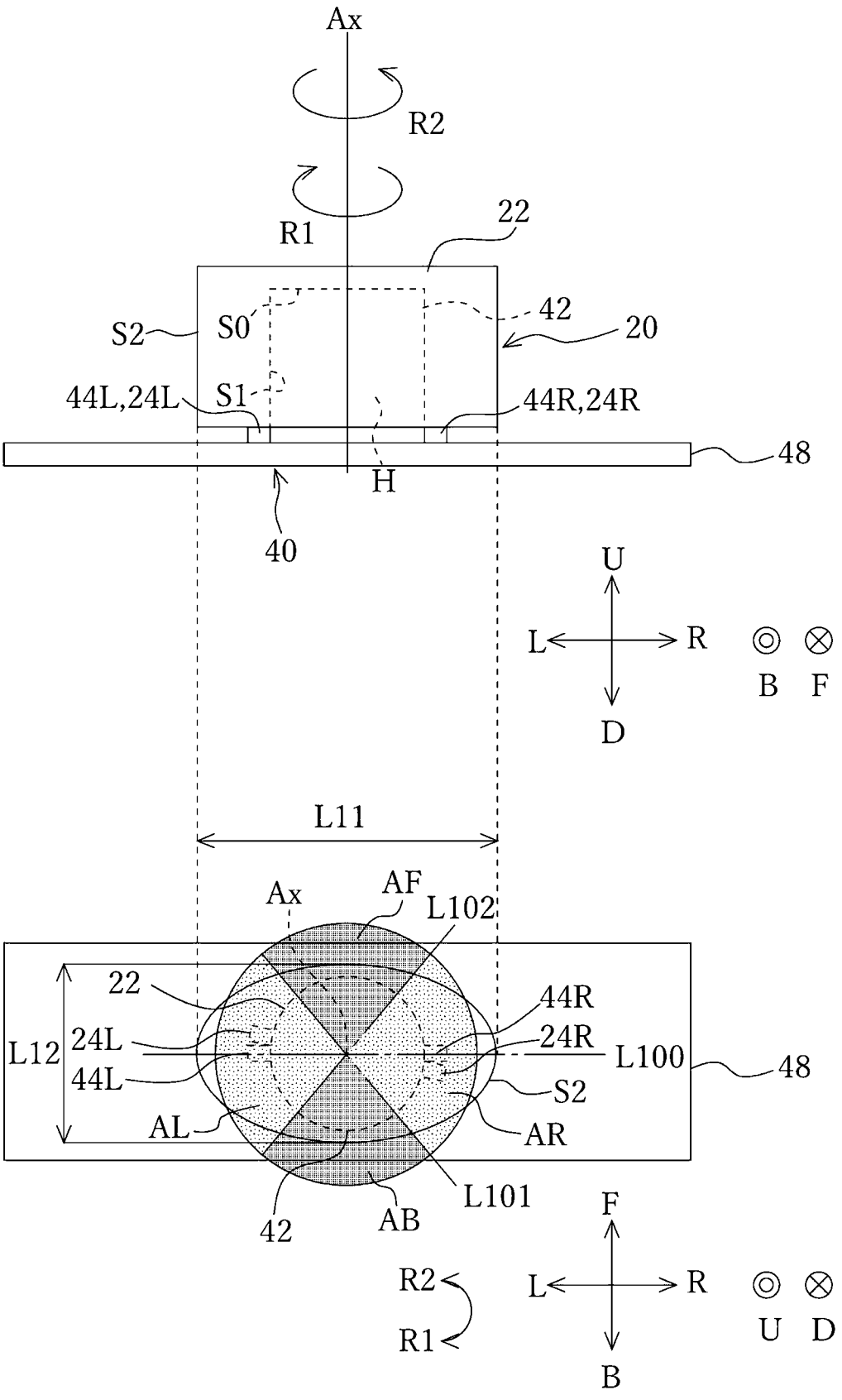

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FIG. 5

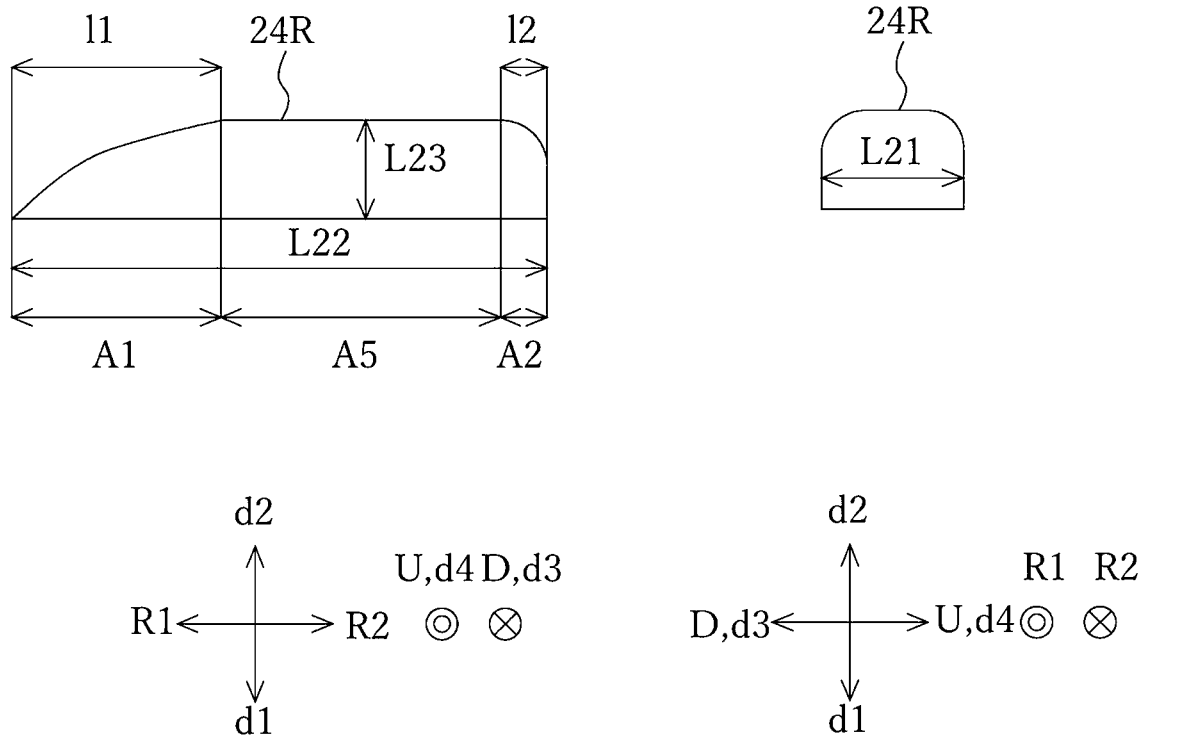


FIG. 6

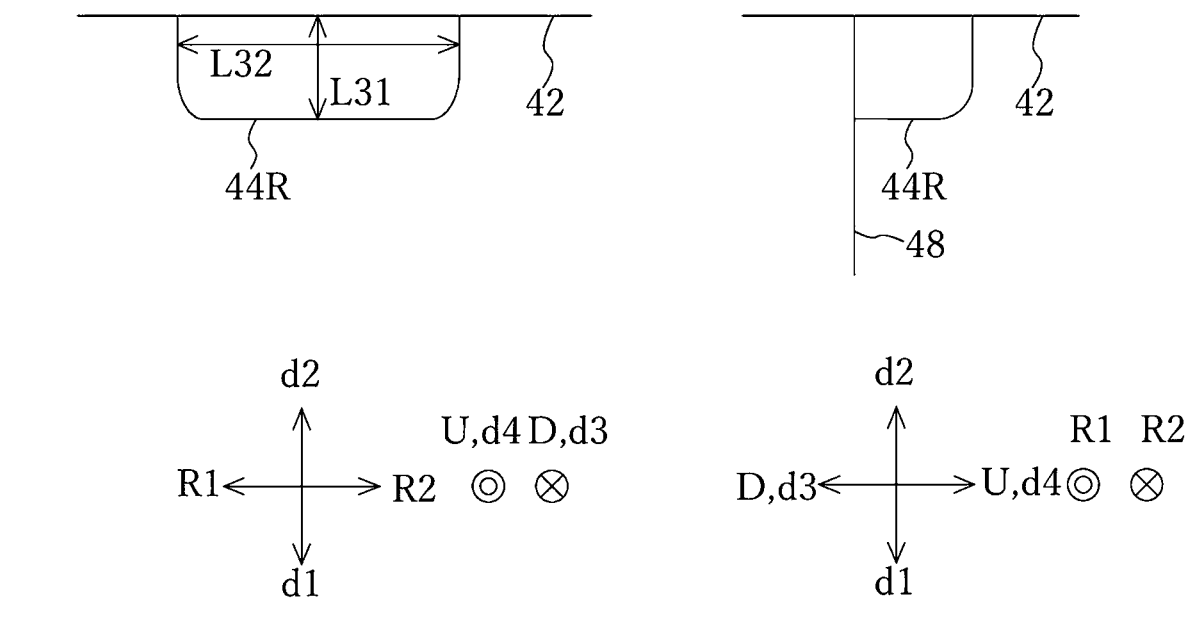

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FIG. 7A

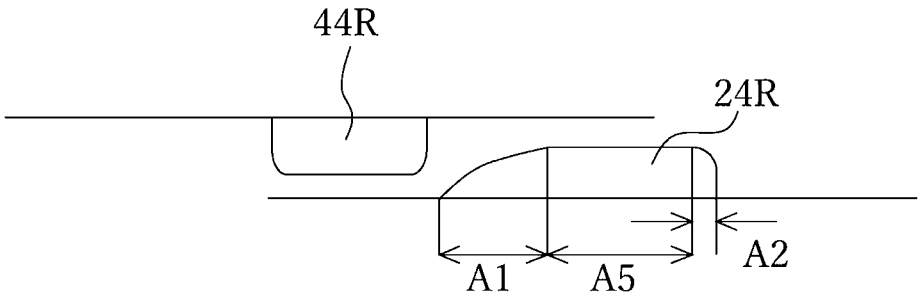



FIG. 7B

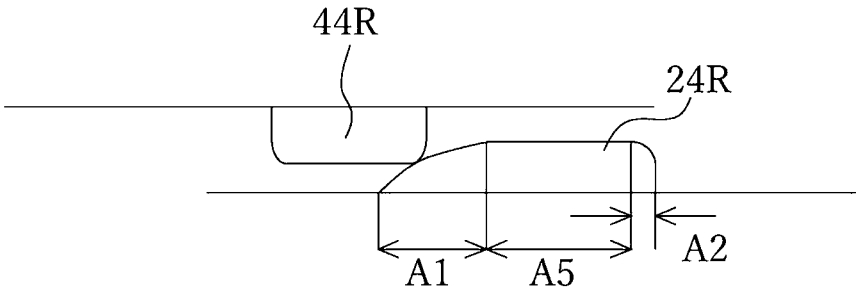



FIG. 7C

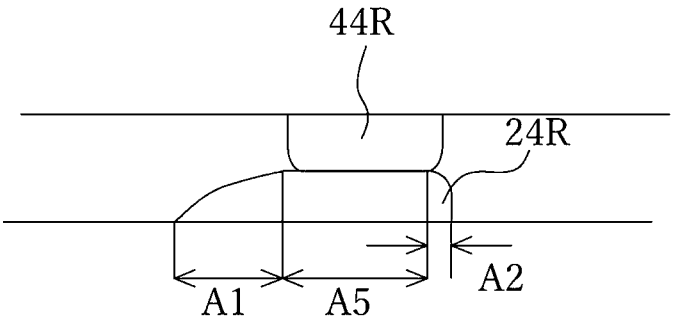
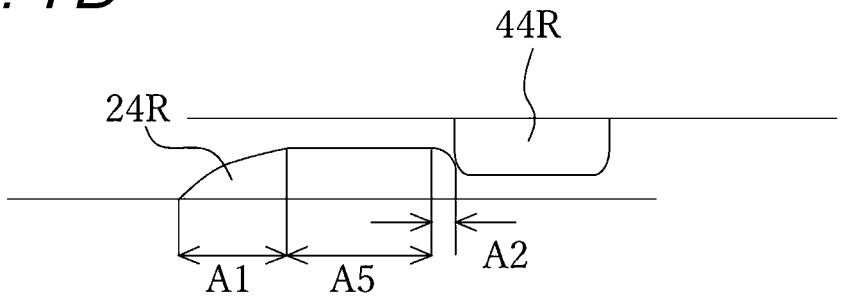



FIG. 7D



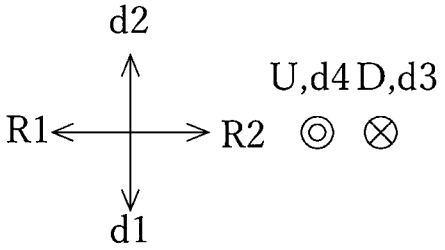



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FIG. 8

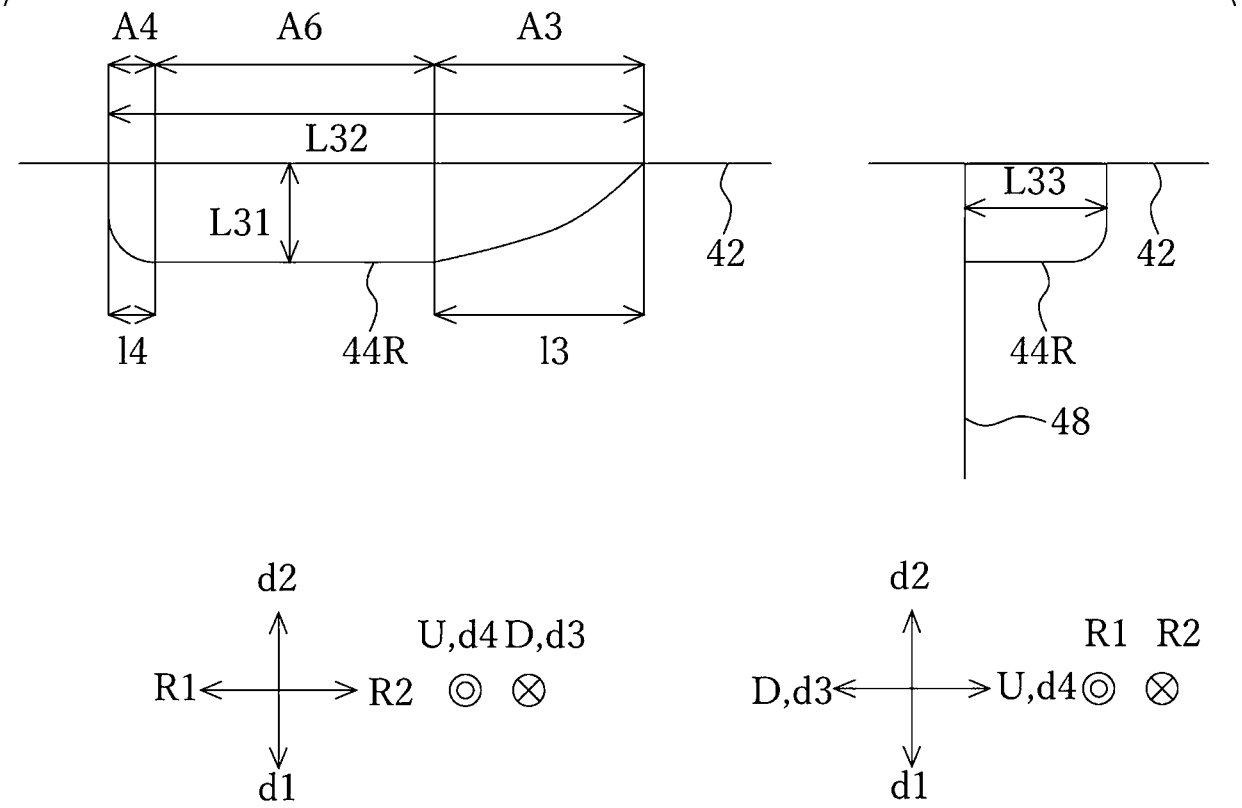


FIG. 9