



(11)

EP 4 260 739 A1

(12)

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

(43) Date of publication:
18.10.2023 Bulletin 2023/42

(51) International Patent Classification (IPC):
A24F 40/65^(2020.01)

(21) Application number: **20965150.4**

(52) Cooperative Patent Classification (CPC):
A24F 40/65

(22) Date of filing: **11.12.2020**

(86) International application number:
PCT/JP2020/046272

(87) International publication number:
WO 2022/123768 (16.06.2022 Gazette 2022/24)

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

(72) Inventors:
• **MASUDA, Yuki**
Tokyo 130-8603 (JP)
• **YAMADA, Manabu**
Tokyo 130-8603 (JP)

(74) Representative: **Hoffmann Eitle**
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

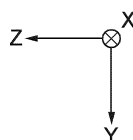
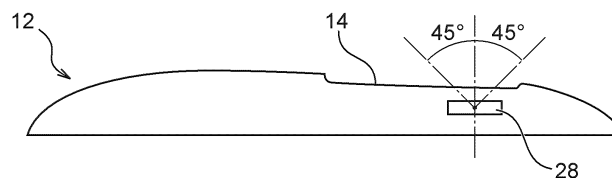
(71) Applicant: **Japan Tobacco Inc.**
Tokyo 105-6927 (JP)

(54) **FLAVOR INHALER AND METHOD FOR MANUFACTURING FLAVOR INHALER**

(57) There is provided a flavor inhaler including a housing including a first wall including a metal portion, an atomizing unit that is housed in the housing, and that generates heat, and a communication unit that is housed in the housing and that communicates with an external

appliance via the first wall, the communication unit being disposed away from the atomizing unit, where the metal portion does not cover the communication unit in a plan view seen from a direction orthogonal to the first wall.

Fig. 7



EP 4 260 739 A1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a flavor inhaler and a flavor inhaler manufacturing method.

BACKGROUND ART

[0002] These days, in relation to an electronic cigarette including a control unit and a cartomizer, it is known to provide a metal housing around the control unit, and to cause the metal housing to function as a shield for wireless communication that is performed by a communication interface disposed inside the control unit (for example, see PTL 1).

CITATION LIST

PATENT LITERATURE

[0003] PTL 1: Japanese Patent Laid-Open No. 2020-74585

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0004] The present disclosure provides a flavor inhaler and a manufacturing method thereof according to which communication with an external appliance that is performed by a communication interface may be prevented from being disturbed.

SOLUTION TO PROBLEM

[0005] A first aspect of the present disclosure is a flavor inhaler including: a housing including a first wall including a metal portion; an atomizing unit that is housed in the housing, and that generates heat; and a communication unit that is housed in the housing and that communicates with an external appliance via the first wall, the communication unit being disposed away from the atomizing unit, where the metal portion does not cover the communication unit in a plan view seen from a direction orthogonal to the first wall.

[0006] In the first aspect described above, the housing housing the atomizing unit that generates heat is covered by the first wall including the metal portion having high heat conductivity, but the communication unit is not covered by the metal portion. Therefore, according to the first aspect, a local high-temperature portion in the housing that is caused by heat generation by the atomizing unit may be prevented through heat diffusion by the metal portion, and it is also possible to prevent communication of the communication unit with an external appliance from being interfered by the metal portion.

[0007] A second aspect of the present disclosure is the

flavor inhaler according to the first aspect, where the metal portion covers at least a part of the atomizing unit in the plan view seen from the direction orthogonal to the first wall.

[0008] In the second aspect described above, the atomizing unit that is a heat source is covered by the metal portion having high heat conductivity on an outer surface of the housing housing the atomizing unit that generates heat. Therefore, according to the second aspect, heat is more effectively diffused on the outer surface of the housing.

[0009] A third aspect of the present disclosure is the flavor inhaler according to the first or second aspect, where half or more of an area of the first wall includes the metal portion.

[0010] In the third aspect described above, half or more of the area of the first wall of the housing housing the atomizing unit that generates heat includes the metal portion having high heat conductivity. Therefore, according to the third aspect, heat from the atomizing unit may be effectively diffused inside the flavor inhaler.

[0011] A fourth aspect of the present disclosure is the flavor inhaler according to the first to third aspects, where, in a cross-section cutting the housing along a plane perpendicular to the first wall, the metal portion of the first wall is not included in a range that is defined to be within an angle range of 45 degrees on each of left and right of a reference straight line that extends from a center of the communication unit toward the first wall along the direction orthogonal to the first wall.

[0012] With the flavor inhaler according to the present disclosure, if the region in the first wall that does not include the metal portion that may interfere with communication with an external appliance is too small, communication disturbance is caused, but if the region in the first wall that does not include the metal portion is too great, heat diffusion by the metal portion is not sufficiently achieved. In the fourth aspect, the angle range of 45 degrees on each of left and right of the reference straight line is secured as a region where the metal portion is not present. Therefore, according to the fourth aspect, it is possible to establish both securing of a communication path between the communication unit and an external appliance and heat diffusion by the metal portion.

[0013] A fifth aspect of the present disclosure is the flavor inhaler according to the first to fourth aspects, where the housing further includes a second wall that faces the first wall, and the atomizing unit and the communication unit are housed in the housing while being located between the first wall and the second wall.

[0014] In the fifth aspect described above, in the set of the first wall and the second wall of the housing that face each other, provided such that the communication unit is located therebetween, the first wall includes the metal portion that does not cover the metal portion. Therefore, according to the fifth aspect, it is possible to establish both securing of a communication path and heat diffusion by the set of the first wall and the second wall of the

housing that face each other such that the communication unit is located therebetween.

[0015] A sixth aspect of the present disclosure is the flavor inhaler according to the first to fifth aspects, the flavor inhaler further including an external cover that covers the first wall.

[0016] In the sixth aspect described above, the first wall of the housing that covers the atomizing unit that generates heat is further covered by the external cover. Therefore, according to the sixth aspect, heat generated by the atomizing unit may be prevented from being transferred to outside the flavor inhaler.

[0017] A seventh aspect of the present disclosure is the flavor inhaler according to the first to sixth aspects, where the communication unit communicates with the external appliance by using an electromagnetic wave.

[0018] In the seventh aspect described above, on the outer surface of the housing housing the communication unit that performs communication by an electromagnetic wave, the communication unit is not covered by the metal portion that interferes with the electromagnetic wave. Therefore, according to the seventh aspect, communication with an external appliance that is performed by the communication unit may be effectively prevented from being disturbed by the metal portion.

[0019] An eighth aspect of the present disclosure is a flavor inhaler manufacturing method including: preparing a housing including a first wall including a metal portion; housing an atomizing unit that generates heat and a communication unit that communicates with an external appliance in the housing; and disposing the metal portion in such a way that the communication unit is not covered in a plan view seen from a direction orthogonal to the first wall.

[0020] With a flavor inhaler manufactured by the eighth aspect described above, an outer surface of the housing housing the atomizing unit that generates heat is covered by the first wall including the metal portion having high heat conductivity, but the communication unit is not covered by the metal portion. Therefore, according to the eighth aspect, there may be provided a flavor inhaler with which communication with an external appliance that is performed by the communication unit may be prevented from being disturbed by the metal portion.

BRIEF DESCRIPTION OF DRAWINGS

[0021]

Fig. 1A is a schematic front view of a flavor inhaler according to a first embodiment.

Fig. 1B is a schematic top view of the flavor inhaler according to the first embodiment.

Fig. 1C is a schematic bottom view of the flavor inhaler according to the first embodiment.

Fig. 2 is a schematic cross-sectional side view of a consumable.

Fig. 3 is a front view of the flavor inhaler according

to the first embodiment, from which an outer housing is removed.

Fig. 4 is a front view of a metal panel according to the first embodiment.

Fig. 5 is a front view of the flavor inhaler from which the outer housing and the metal panel are removed.

Fig. 6 is a cross-sectional view of the flavor inhaler taken along arrows 6-6 shown in Fig. 1B.

Fig. 7 is a simplified side view showing a relationship between the metal panel and a Bluetooth (registered trademark) interface according to the first embodiment.

Fig. 8A is a perspective view of a chamber.

Fig. 8B is a cross-sectional view of the chamber taken along arrows 8B-8B shown in Fig. 8A.

Fig. 9A is a cross-sectional view of the chamber taken along arrows 9A-9A shown in Fig. 8B.

Fig. 9B is a cross-sectional view of the chamber taken along 9B-9B shown in Fig. 8B.

Fig. 10 is a perspective view of the chamber and a heating unit.

Fig. 11 is a cross-sectional view shown in Fig. 9B, where the consumable is disposed at a desired position inside the chamber.

Fig. 12 is a partial cross-sectional view of the flavor inhaler taken along arrows 12-12 shown in Fig. 1B.

Fig. 13 is a flavor inhaler according to a second embodiment, from which the outer housing is removed.

Fig. 14 is a front view of a metal panel according to the second embodiment.

Fig. 15 is a simplified side view showing a relationship between the metal panel and the Bluetooth interface according to the second embodiment.

DESCRIPTION OF EMBODIMENTS

[First Embodiment]

[0022] Hereinafter, a first embodiment of the present disclosure will be described with reference to the drawings. In the drawings described below, same or corresponding structural elements will be denoted by a same reference sign, and redundant description thereof will be omitted.

[0023] Fig. 1A is a schematic front view of a flavor inhaler 100 according to the first embodiment. Fig. 1B is a schematic top view of the flavor inhaler 100 according to the first embodiment. Fig. 1C is a schematic bottom view of the flavor inhaler 100 according to the first embodiment. In the drawings described in the present specification, an X-Y-Z orthogonal coordinate system may be added for the sake of description. In the coordinate system, a Z-axis faces vertically upward, an X-Y plane cuts the flavor inhaler 100 in a horizontal direction, and a Y-axis extends from a front surface to a back surface of the flavor inhaler 100. The Z-axis may also be said to be an insertion direction of a consumable that is to be housed in a chamber 50 of an atomizing unit 30 described later.

Furthermore, the Y-axis may also be said to be a direction that is orthogonal to the insertion direction of the consumable, along which a first wall 10a and a second wall 10b described later face each other. Moreover, an X-axis direction may be said to be a device longitudinal direction on a plane that is orthogonal to the insertion direction of the consumable. A Y-axis direction may be said to be a device transverse direction on the plane that is orthogonal to the insertion direction of the consumable.

[0024] For example, the flavor inhaler 100 according to the first embodiment generates an aerosol including a flavor by heating a stick-shaped consumable including a flavor source including an aerosol source.

[0025] As shown in Figs. 1A to 1C, the flavor inhaler 100 includes an outer housing 101 formed from a front cover 101A and a rear cover 101B, and a slide cover 102. The front cover 101A is an example of an external cover of the present disclosure.

[0026] The outer housing 101 forms an outermost housing of the flavor inhaler 100, and has a size that can be fitted in a hand of a user. At the time of using the flavor inhaler 100, a user may hold the flavor inhaler 100 in the hand, and may inhale the aerosol. Additionally, with respect to the outer housing 101, the front cover 101A may be formed of resin such as polycarbonate, and the rear cover 101B may be formed of metal such as aluminum, for example. However, the outer housing 101 is not limited to the materials mentioned above, and may be formed of resin, or more specifically, polycarbonate (PC), acrylonitrile-butadiene-styrene (ABS) resin, polyether ether ketone (PEEK), or a polymer alloy containing a plurality of types of polymers, and selection may be freely made therefrom as appropriate.

[0027] The outer housing 101 includes an opening, not shown, for receiving a consumable, and the slide cover 102 is slidably attached to the outer housing 101 to close the opening. More specifically, the slide cover 102 is movable along an outer surface of the outer housing 101, between a close position of closing the opening in the outer housing (a position shown in Figs. 1A and 1B) and an open position of opening the opening. For example, the slide cover 102 may be moved between the close position and the open position by the user manually operating the slide cover 102. The slide cover 102 may thus allow or restrict access of the consumable into the flavor inhaler 100.

[0028] Figs. 1B and 1C show the front cover 101A and the rear cover 101B of the flavor inhaler 100 to have a substantially same thickness, but a structure of the outer housing 101 is not limited thereto. One of the front cover 101A or the rear cover 101B may be made thicker than the other.

[0029] The flavor inhaler 100 may further include a terminal, not shown. The terminal may be an interface for connecting the flavor inhaler 100 to an external power source, for example. In the case where a power source of the flavor inhaler 100 is a rechargeable battery, current may be supplied from the external power source to the

power source and the power source may be charged when the external power source is connected to the terminal. Furthermore, by connecting a data transmission cable to the terminal, data about operation of the flavor inhaler 100 may be transmitted to an external device.

[0030] Next, a consumable that is used with the flavor inhaler 100 according to the first embodiment will be described. Fig. 2 is a schematic cross-sectional side view of a consumable 110. In the first embodiment, a smoking system may be formed by the flavor inhaler 100 and the consumable 110. In the example shown in Fig. 2, the consumable 110 includes a smokable substance 111, a cylindrical member 114, a hollow filter portion 116, and a filter portion 115. The smokable substance 111 is wrapped with a first rolling paper 112. The cylindrical member 114, the hollow filter portion 116, and the filter portion 115 are wrapped with a second rolling paper 113 different from the first rolling paper 112. The second rolling paper 113 is also wrapped around a part of the first rolling paper 112 that is wrapped around the smokable substance 111. The cylindrical member 114, the hollow filter portion 116, and the filter portion 115 are thus joined to the smokable substance 111. Additionally, the second rolling paper 113 may be omitted, and the cylindrical member 114, the hollow filter portion 116, and the filter portion 115 may instead be joined to the smokable substance 111 using the first rolling paper 112. A lip release agent 117 is applied on an outer surface of the second rolling paper 113, around an end portion on the filter portion 115 side, to prevent lips of the user from sticking to the second rolling paper 113. The part of the consumable 110 where the lip release agent 117 is applied functions as a mouthpiece of the consumable 110.

[0031] The smokable substance 111 may include a flavor source, such as tobacco, and an aerosol source, for example. Furthermore, the first rolling paper 112 wrapped around the smokable substance 111 may be a breathable sheet member. The cylindrical member 114 may be a paper tube or a hollow filter. In the example shown in Fig. 2, the consumable 110 includes the smokable substance 111, the cylindrical member 114, the hollow filter portion 116, and the filter portion 115, but the structure of the consumable 110 is not limited thereto. For example, the hollow filter portion 116 may be omitted, and the cylindrical member 114 and the filter portion 115 may be disposed next to each other.

[0032] Fig. 3 is a front view of the flavor inhaler 100 from which the outer housing 101 is removed. Fig. 4 is a front view of just metal panel 12. Fig. 5 is a front view of the flavor inhaler 100 from which the outer housing 101 and the metal panel 12 are removed.

[0033] As shown in Fig. 5, when the outer housing 101 and the metal panel 12 are removed, an inner housing 10 is exposed. The inner housing 10 houses the atomizing unit 30 described later, a power source unit 20, a Bluetooth (registered trademark) interface 28 that is connected to a circuit unit, not shown, and the like, and is, for example, made of resin, or more specifically, may be

formed of polycarbonate (PC), acrylonitrile-butadiene-styrene (ABS) resin, polyether ether ketone (PEEK), a polymer alloy containing a plurality of types of polymers, or the like. However, the inner housing 10 is not limited to the materials mentioned above. The inner housing 10 includes the first wall 10a and the second wall 10b (see Fig. 12) that face each other in the Y-axis direction, and a side wall 10c that connects the first wall 10a and the second wall 10b. Fig. 5 shows the first wall 10a and the side wall 10c. The inner housing 10 to which the metal panel 12 is attached is an example of a housing of the present disclosure.

[0034] The metal panel 12 has thermal conductivity that is higher than the thermal conductivity of the inner housing 10, and is provided to cover the first wall 10a of the inner housing 10. The metal panel 12 may be formed of aluminum, for example. Furthermore, the metal panel 12 may be shaped as a sheet. The metal panel 12 may be provided close to or in contact with the first wall 10a of the inner housing 10 and an end portion of the side wall 10c. More specifically, for example, the metal panel 12 may be attached to the first wall 10a of the inner housing 10. Because the metal panel 12 having high thermal conductivity functions as a heat diffusion member for diffusing heat that is transmitted from the inner housing 10, heat that is generated by the atomizing unit 30 may be diffused inside the flavor inhaler 100. The metal panel 12 is an example of a metal portion of the present disclosure. Furthermore, a set of the metal panel 12 and the first wall 10a is an example of a first wall of the present disclosure.

[0035] As shown in Figs. 3 and 4, an opening portion 14 is provided in the metal panel 12, at a lower part in a Z-axis direction. Accordingly, as shown in Fig. 3, a part of the first wall 10a of the inner housing 10 is exposed from the opening portion 14 in the metal panel 12. As described later, the part of the first wall 10a of the inner housing 10 that is exposed from the opening portion 14 in the metal panel 12 includes a region corresponding to the Bluetooth interface 28 that is housed inside the inner housing 10.

[0036] As described later, shape and size of the opening portion 14 in the metal panel 12 according to the first embodiment may be determined as appropriate on condition that the Bluetooth interface 28 is not covered. However, the greater the area of the metal panel 12, the more improved the effect of diffusion of heat by the metal panel 12, and thus, the metal panel 12 is desirably provided covering 50% or more of an area of an outer surface of the inner housing 10. According to the first embodiment, the metal panel 12 covers the first wall 10a except for the opening portion 14, and thus, heat from the atomizing unit 30 reaching the first wall 10a is diffused by the metal panel 12, and the inner housing 10 may be prevented from being locally heated to a high temperature.

[0037] As described later, the atomizing unit 30 generates heat inside the inner housing 10, and thus, a temperature of the first wall 10a tends to be locally increased at a periphery of the atomizing unit 30. Accordingly, the

metal panel 12 desirably covers at least a part of a region, of the first wall 10a of the inner housing 10, corresponding to the atomizing unit 30 that is housed inside the inner housing 10.

[0038] Next, an internal structure of the flavor inhaler 100 will be described. Fig. 6 is a cross-sectional view of the flavor inhaler 100 taken along arrows 6-6 shown in Fig. 1B. Fig. 7 is a simplified cross-sectional view of the flavor inhaler 100, cut along a cross-section that is orthogonal to an X-axis and that includes the Bluetooth interface 28.

[0039] As shown in Fig. 6, the power source unit 20 and the atomizing unit 30 are provided in an inner space of the inner housing 10 of the flavor inhaler 100. A circuit unit, not shown, is also provided in the inner space of the inner housing 10.

[0040] The circuit unit includes a microprocessor, for example, and is capable of controlling supply of power from the power source unit 20 to the atomizing unit 30. The circuit unit may thus control heating of the consumable 110 by the atomizing unit 30. Furthermore, the circuit unit is electrically connected to the Bluetooth interface 28. The Bluetooth interface 28 is an example of a communication unit of the present disclosure.

[0041] The flavor inhaler 100 of the first embodiment is capable of communicating with an external appliance via the Bluetooth interface 28.

[0042] The region of the first wall 10a of the inner housing 10 shown in Fig. 5 that covers the Bluetooth interface 28 forms a part of the region that is exposed from the opening portion 14 in the metal panel 12 shown in Fig. 3. The Bluetooth interface 28 is positioned in a Y-axis positive direction from the part of the first wall 10a that is exposed from the opening portion 14 in Fig. 3. That is, in a front view of the flavor inhaler 100, the Bluetooth interface 28 is not covered by the metal panel 12. Accordingly, although a metal member generally interferes with electromagnetic waves, the flavor inhaler 100 may communicate with an external appliance via the Bluetooth interface 28 using, as a path, at least the region that is exposed from the opening portion 14 in the metal panel 12.

[0043] A relative arrangement of the metal panel 12 and the Bluetooth interface 28 according to the first embodiment will be described in detail with reference to Fig. 7. For the sake of description, Fig. 7 omits illustration of the inner housing 10 and members, other than the Bluetooth interface 28, that are housed inside the inner housing 10.

[0044] As shown in Fig. 7, a region that is defined by an angle range of 45 degrees on each of left and right of a reference straight line that is a straight line that is parallel to the Y-axis and that extends from a center of the Bluetooth interface 28 toward the front surface of the flavor inhaler 100 is exposed from the opening portion 14 in the metal panel 12. The cross-section shown in Fig. 7 is an example of a cross-section that includes the Bluetooth interface 28 and that is perpendicular to the X-axis,

and a different cross-section may also be selected along the X-axis. In this case, a position, in the selected cross-section, of the center of the Bluetooth interface 28 on a plane parallel to a Y-Z plane is possibly not the same as in Fig. 7. However, the region that is defined by the angle range of 45 degrees on each of left and right of the reference straight line described above is exposed from the opening portion 14 in the metal panel 12 in any cross-section. However, in a case where the Bluetooth interface 28 includes a protrusion portion or the like that does not function as a transmission/reception antenna for electromagnetic waves, the condition regarding the region described above that is defined by the center of the Bluetooth interface 28 and the reference straight line is not applied to a part including only the protrusion portion. That is, in a case where the Bluetooth interface 28 includes, for the sake of design, a protrusion portion that does not actually contribute to transmission/reception of electronic magnetic waves, the protrusion portion does not have to satisfy the condition shown in Fig. 7. The reference straight line and the angle range defined around the reference straight line are set based on a part that actually contributes to transmission/reception of electromagnetic waves.

[0045] With the flavor inhaler 100 of the first embodiment, the region that is defined by the angle range described above is secured as a path to be used for communication with an external appliance that is performed via the Bluetooth interface 28.

[0046] The power source unit 20 includes a power source 21 that is electrically connected to the circuit unit not shown. For example, the power source 21 may be a rechargeable battery or a non-rechargeable battery. The power source 21 is electrically connected to the atomizing unit 30 via the circuit unit. The power source 21 may thus supply power to the atomizing unit 30 so that the consumable 110 is appropriately heated.

[0047] As shown in Fig. 6, the atomizing unit 30 includes the chamber 50 extending in a longitudinal direction of the consumable 110, a heating unit 40 surrounding a part of the chamber 50, a heat insulating portion 32, and an insertion guide member 34 having a substantially cylindrical shape. The chamber 50 houses the consumable 110. The heating unit 40 is in contact with an outer circumferential surface of the chamber 50, and the heating unit 40 heats the consumable 110 that is housed in the chamber 50. Details of the chamber 50 and the heating unit 40 will be given.

[0048] The heat insulating portion 32 is disposed to surround the chamber 50 and the heating unit 40. The heat insulating portion 32 may be an aerogel, for example. The insertion guide member 34 is formed of a resin material such as PEEK, PC, or ABS, and is provided between the slide cover 102 in the close position and the chamber 50. When the slide cover 102 is in the open position, the insertion guide member 34 communicates with outside of the flavor inhaler 100, and guides insertion of the consumable 110 into the chamber 50 when the

consumable 110 is inserted in the insertion guide member 34.

[0049] The flavor inhaler 100 further includes a first support portion 37 and a second support portion 38 for supporting both ends of the chamber 50 and the heat insulating portion 32. The first support portion 37 is disposed to support end portions of the chamber 50 and the heat insulating portion 32 on the slide cover 102 side (a Z-axis positive direction side). The second support portion 38 is disposed to directly or indirectly support end portions of the chamber 50 and the heat insulating portion 32 on a Z-axis negative direction side. Moreover, as shown in Fig. 6, a bottom member 36 may be provided on a bottom part of the chamber 50. The bottom member 36 may function as a stopper that achieves positioning of the consumable 110 that is inserted in the chamber 50. The bottom member 36 may demarcate a space where air can be supplied, in a surface where the consumable 110 abuts against. The surface of the bottom member 36 where the consumable 110 abuts against is uneven, and the bottom member 36 may, but not limited to, be formed of a resin material such as PEEK, metal, glass, ceramic or the like. Furthermore, the first support portion 37 and the second support portion 38 may be formed of elastomer such as silicone rubber, for example. Moreover, in the case of joining the bottom member 36 to the bottom part of the chamber 50, an adhesive that may be made of a resin material such as epoxy resin, or an organic material may be used.

[0050] Next, a structure of the chamber 50 will be described. Fig. 8A is a perspective view of the chamber 50. Fig. 8B is a cross-sectional view of the chamber 50 taken along arrows 8B-8B shown in Fig. 8A. Fig. 9A is a cross-sectional view of the chamber 50 taken along arrows 9A-9A shown in Fig. 8B. Fig. 9B is a cross-sectional view of the chamber 50 taken along 9B-9B shown in Fig. 8B. Fig. 10 is a perspective view of the chamber 50 and the heating unit 40. As shown in Figs. 8A and 8B, the chamber 50 may be a cylindrical member including an opening 52 that allows insertion of the consumable 110, and a cylindrical side wall portion 60 for housing the consumable 110. The chamber 50 is desirably formed of a material that has heat resistance and that has small thermal expansion coefficient, and may be formed of metal such as stainless steel, resin such as PEEK, glass, ceramic or the like, for example. The consumable 110 may thus be efficiently heated in the chamber 50.

[0051] As shown in Figs. 8B and 9B, the side wall portion 60 includes a contact portion 62 and a separated portion 66. When the consumable 110 is disposed at the desired position inside the chamber 50, the contact portion 62 contacts or presses a part of the consumable 110, and the separated portion 66 is separate from the consumable 110. Additionally, in the present specification, "desired position inside the chamber 50" refers to a position where the consumable 110 is appropriately heated, or a position of the consumable 110 when the user smokes. The contact portion 62 includes an inner surface

62a and an outer surface 62b. The separated portion 66 includes an inner surface 66a and an outer surface 66b. As shown in Fig. 10, the heating unit 40 is disposed on the outer surface 62b of the contact portion 62. The heating unit 40 is desirably disposed on the outer surface 62b of the contact portion 62 with no gap in between. Additionally, the heating unit 40 may include an adhesive layer. In this case, the heating unit 40 including the adhesive layer is desirably disposed on the outer surface 62b of the contact portion 62 with no gap in between.

[0052] As shown in Figs. 8A and 9B, the outer surface 62b of the contact portion 62 is flat. In the case where a strip-shaped electrode 48 is connected to the heating unit 40 disposed on the outer surface 62b of the contact portion 62 as shown in Fig. 10, because the outer surface 62b of the contact portion 62 is flat, the strip-shaped electrode 48 may be prevented from being warped. As shown in Figs. 8B and 9B, the inner surface 62a of the contact portion 62 is flat. Furthermore, as shown in Figs. 8B and 9B, a thickness of the contact portion 62 is uniform.

[0053] As shown in Figs. 8A, 8B, and 9B, the chamber 50 includes two contact portions 62 in a circumferential direction of the chamber 50, and the two contact portions 62 face each other while being parallel to each other. A distance between at least parts of the inner surfaces 62a of the two contact portions 62 is desirably smaller than a width of a part where the consumable 110 that is inserted in the chamber 50 is disposed between the contact portions 62.

[0054] As shown in Fig. 9B, the inner surface 66a of the separated portion 66 may have, as a whole, an arc-shaped cross-section on a plane orthogonal to a longitudinal direction (a Z-axis direction) of the chamber 50. Furthermore, the separated portion 66 is disposed adjacent to the contact portions 62 in the circumferential direction.

[0055] As shown in Fig. 8B, the chamber 50 may include a hole 56a in a bottom portion 56 to allow the bottom member 36 shown in Fig. 6 to penetrate and be disposed inside the chamber 50. The bottom member 36 provided on the bottom portion 56 supports a part of the consumable 110 that is inserted in the chamber 50 in such a way that at least a part of an end surface of the consumable 110 is exposed. Furthermore, the bottom portion 56 may support a part of the consumable 110 in such a way that the end surface of the consumable 110 that is exposed communicates with a gap 67 (see Fig. 11) described later.

[0056] As shown in Figs. 8A and 8B, the chamber 50 desirably includes a cylindrical non-holding portion 54 between the opening 52 and the side wall portion 60. A gap may be formed between the non-holding portion 54 and the consumable 110 in a state where the consumable 110 is positioned at the desired position in the chamber 50. Furthermore, as shown in Figs. 8A and 8B, the chamber 50 desirably includes a first guide portion 58 including a tapered surface 58a that connects an inner surface of the non-holding portion 54 and the inner surfaces 62a of the contact portions 62.

[0057] As shown in Fig. 10, the heating unit 40 includes a heating element 42. The heating element 42 may be a heating track, for example. The heating element 42 is desirably disposed to heat the contact portion 62 without coming into contact with the separated portion 66 of the chamber 50. In other words, the heating element 42 is desirably disposed only on the outer surface of the contact portion 62. Heating capacity of the heating element 42 may be different between a part for heating the separated portion 66 of the chamber 50 and a part for heating the contact portion 62. More specifically, the heating element 42 may heat the contact portion 62 to a temperature higher than that of the separated portion 66. For example, an arrangement density of the heating track of the heating element 42 may be adjusted between the contact portion 62 and the separated portion 66. Furthermore, the heating element 42 may have substantially same heating capacity along an entire circumference of the chamber 50, and may be wound around an outer circumference of the chamber 50. As shown in Fig. 10, in addition to the heating element 42, the heating unit 40 desirably includes an electrically insulating member 44 that covers at least one surface of the heating element 42. In the first embodiment, the electrically insulating member 44 is disposed to cover both surfaces of the heating element 42.

[0058] Fig. 11 is a cross-sectional view shown in Fig. 9B, where the consumable 110 is disposed at a desired position inside the chamber 50. As shown in Fig. 11, when the consumable 110 is disposed at the desired position inside the chamber 50, the consumable 110 may be pressed by coming into contact with the contact portion 62 of the chamber 50. The gap 67 is formed between the consumable 110 and the separated portion 66. The gap 67 may communicate with the opening 52 in the chamber 50 and the end surface of the consumable 110 positioned inside the chamber 50. Accordingly, air flowing in from the opening 52 in the chamber 50 may pass through the gap 67 and flow into the consumable 110. In other words, an air passage (the gap 67) is formed between the consumable 110 and the separated portion 66.

[0059] Next, an arrangement position and an arrangement manner of the atomizing unit 30 inside the inner housing 10 will be described. Fig. 12 is a partial cross-sectional view of the flavor inhaler 100 taken along arrows 12-12 shown in Fig. 1B.

[0060] As described above, in the first embodiment, the air passage (the gap 67) is formed between the separated portion 66 and the consumable 110, and thus, air passing through the air passage may absorb heat from the separated portion 66 and may cool the separated portion 66.

[0061] As described above, the heating element 42 of the heating unit 40 is disposed in such a way as to heat the contact portion 62 without coming into contact with the separated portion 66 of the side wall portion 60 of the chamber 50. That is, because the separated portion 66 is not directly heated by the heating unit 40, heating of

the separated portion 66 by the heating unit 40 may be suppressed.

[0062] As shown in Fig. 12, the outer housing 101 houses the inner housing 10 inside. An inner surface (a surface on the Y-axis positive direction side) of the front cover 101A of the outer housing 101 faces an outer surface (a surface on the Y-axis negative direction side) of the first wall 10a of the inner housing 10 across the metal panel 12. Because the first wall 10a of the inner housing 10 is covered by the front cover 101A of the outer housing 101, heat from the atomizing unit 30 that is transferred to the first wall 10a of the inner housing 10 may be prevented from being transferred to outside the flavor inhaler 100. As a result, the user may be prevented from feeling uncomfortable when holding the flavor inhaler 100.

(Second Embodiment)

[0063] Hereinafter, a second embodiment of the present disclosure will be described. Additionally, a part having a same structure as that in the first embodiment will be denoted by a same reference sign, and description thereof will be omitted.

[0064] Fig. 13 is a front view of a flavor inhaler 200 according to the second embodiment, from which the outer housing 101 is removed. Fig. 14 is a front view of just metal panel 212. Fig. 15 is a simplified cross-sectional view of the flavor inhaler 200, cut along a cross-section that is orthogonal to the X-axis and that includes the Bluetooth interface 28.

[0065] The flavor inhaler 200 according to the second embodiment is different from the flavor inhaler 100 according to the first embodiment with respect to the structure of the metal panel 212. That is, with the flavor inhaler 200 according to the second embodiment, the metal panel 212 shown in Fig. 14 is provided covering the first wall 10a of the inner housing 10, instead of the metal panel 12 according to the first embodiment shown in Fig. 4. The metal panel 212 according to the second embodiment is another example of the metal portion of the present disclosure.

[0066] As shown in Figs. 3 and 4, the metal panel 12 according to the first embodiment includes the opening portion 14 at a lower part in the Z-axis direction. As shown in Fig. 14, the metal panel 212 according to the second embodiment does not include the opening portion, is cut around a center in the Z-axis direction, and does not extend to a lower part in the Z-axis direction. A solid line that is shown in Fig. 13 to horizontally divide the flavor inhaler 200 (in a direction parallel to the X-axis) indicates a lower end portion 212A of the metal panel 212. Accordingly, in Fig. 13, at a part lower than the lower end portion 212A of the metal panel 212, the first wall 10a and the side wall 10c of the inner housing 10 are exposed.

[0067] As in the first embodiment, from the standpoint of efficient heat diffusion, the metal panel 212 according to the second embodiment is desirably provided to cover 50% or more of the area of the outer surface of the inner

housing 10. Additionally, as shown in Fig. 6, the atomizing unit 30 that generates heat is disposed inside the inner housing 10, on an upper part in the Z-axis direction. According to the second embodiment, the metal panel 212 covers an upper part of the first wall 10a in the Z-axis direction, corresponding to the atomizing unit, and thus, heat from the atomizing unit 30 reaching the first wall 10a is diffused by the metal panel 212, and the inner housing 10 may be prevented from being locally heated to a high temperature.

[0068] As shown in Fig. 6, the Bluetooth interface 28 is disposed inside the inner housing 10, at a lower part in the Z-axis direction. The Bluetooth interface 28 is positioned in the Y-axis positive direction from a part of the first wall 10a in Fig. 13 that is positioned at a lower part than the lower end portion 212A of the metal panel 212 in the Z-axis direction and that is exposed. That is, in a front view of the flavor inhaler 200, the Bluetooth interface 28 is not covered by the metal panel 212. Accordingly, although a metal member generally interferes with electromagnetic waves, the flavor inhaler 200 may communicate with an external appliance via the Bluetooth interface 28 using, as a path, at least the region that is not covered by the metal panel 212.

[0069] A relative arrangement of the metal panel 212 and the Bluetooth interface 28 according to the second embodiment will be described in detail with reference to Fig. 15. For the sake of description, Fig. 15 omits illustration of the inner housing 10 and members, other than the Bluetooth interface 28, that are housed inside the inner housing 10.

[0070] As shown in Fig. 15, a region that is defined by an angle range of 45 degrees on each of left and right of a reference straight line that is a straight line that is parallel to the Y-axis and that extends from the center of the Bluetooth interface 28 toward the front surface of the flavor inhaler 100 is positioned more in the negative direction of the Z-axis than the lower end portion 212A of the metal panel 212. A cross-section shown in Fig. 15 is an example of a cross-section that includes the Bluetooth interface 28 and that is perpendicular to the X-axis, and a different cross-section may also be selected along the X-axis. In this case, a position, in the selected cross-section, of the center of the Bluetooth interface 28 on the plane parallel to the Y-Z plane is possibly not the same as in Fig. 15. However, the region that is defined by the angle range of 45 degrees on each of left and right of the reference straight line described above is positioned more in the negative direction of the Z-axis than the lower end portion 212A of the metal panel 212 in any cross-section. However, as in the first embodiment, in a case where the Bluetooth interface 28 includes a protrusion portion or the like that does not function as a transmission/reception antenna for electromagnetic waves, the condition regarding the region described above that is defined by the center of the Bluetooth interface 28 and the reference straight line described above is not applied to a part including only the protrusion portion. That is, in

a case where the Bluetooth interface 28 includes, for the sake of design, a protrusion portion that does not actually contribute to transmission/reception of electronic magnetic waves, the protrusion portion does not have to satisfy the condition shown in Fig. 15. As in the first embodiment, the reference straight line and the angle range defined around the reference straight line are set based on a part that actually contributes to transmission/reception of electromagnetic waves.

[0071] With the flavor inhaler 200 of the second embodiment, the region that is defined by the angle range described above is secured as a path to be used for communication with an external appliance that is performed via the Bluetooth interface 28.

[0072] Heretofore, the embodiments of the present disclosure have been described, but the present disclosure is not limited to the embodiments described above, and various modifications may be made within the scope of the technical idea described in the claims, the specification, and the drawings. Any shape or material not directly described in the specification and the drawings fall within the scope of the technical idea of the present disclosure as long as the advantageous effects of the present disclosure may be achieved by the same. For example, the flavor inhaler 100 of the present disclosure includes a so-called counter-flow air passage with which air flowing in from the opening 52 in the chamber 50 is supplied to the end surface of the consumable 110, but such a case is not restrictive, and a so-called bottom-flow air passage with which air is supplied from the bottom portion 56 of the chamber 50 into the chamber 50 may instead be provided. Furthermore, the heating element 42 does not have to adopt resistance heating and may instead adopt induction heating. In this case, the heating element 42 may heat the chamber 50 by induction heating. Moreover, in the case where the consumable 110 includes a susceptor, the susceptor of the consumable 110 may be heated by the heating element 42 by induction heating.

REFERENCE SIGNS LIST

[0073]

10	inner housing
10a	first wall
10b	second wall
10c	side wall
12	metal panel
14	opening portion
20	power source unit
21	power source
28	Bluetooth interface
30	atomizing unit
32	heat insulating portion
34	insertion guide member
36	bottom member
37	first support portion
38	second support portion

40	heating unit	
42	heating element	
44	electrically insulating member	
48	electrode	
5	50	chamber
	52	opening
	54	non-holding portion
	56	bottom portion
	56a	hole
10	58	first guide portion
	58a	tapered surface
	60	side wall portion
	62	contact portion
	62a	inner surface
15	62b	outer surface
	66	separated portion
	66a	inner surface
	66b	outer surface
	67	gap
20	100	flavor inhaler
	101	outer housing
	101A	front cover
	101B	rear cover
	101C	third wall
25	102	slide cover
	110	consumable
	111	smokable substance
	112	first rolling paper
	113	second rolling paper
30	114	cylindrical member
	115	filter portion
	116	hollow filter portion
	117	lip release agent
	200	flavor inhaler
35	212	metal panel
	212A	lower end portion

Claims

40

1. A flavor inhaler comprising:

a housing including a first wall including a metal portion;
 45 an atomizing unit that is housed in the housing, and that generates heat; and
 a communication unit that is housed in the housing and that communicates with an external appliance via the first wall, the communication unit being disposed away from the atomizing unit, wherein
 50 the metal portion does not cover the communication unit in a plan view seen from a direction orthogonal to the first wall.

55

2. The flavor inhaler according to claim 1, wherein the metal portion covers at least a part of the atomizing unit in the plan view seen from the direction orthog-

onal to the first wall.

3. The flavor inhaler according to claim 1 or 2, wherein half or more of an area of the first wall includes the metal portion. 5

4. The flavor inhaler according to any one of claims 1 to 3, wherein, in a cross-section cutting the housing along a plane perpendicular to the first wall, the metal portion of the first wall is not included in a range that is defined to be within an angle range of 45 degrees on each of left and right of a reference straight line that extends from a center of the communication unit toward the first wall along the direction orthogonal to the first wall. 10
15

5. The flavor inhaler according to any one of claims 1 to 4, wherein

the housing further includes a second wall that faces the first wall, and 20
 the atomizing unit and the communication unit are housed in the housing while being located between the first wall and the second wall. 25

6. The flavor inhaler according to any one of claims 1 to 5, further comprising an external cover that covers the first wall.

7. The flavor inhaler according to any one of claims 1 to 6, wherein the communication unit communicates with the external appliance by using an electromagnetic wave. 30

8. A flavor inhaler manufacturing method comprising: 35

preparing a housing including a first wall including a metal portion;
 housing an atomizing unit that generates heat and a communication unit that communicates with an external appliance in the housing; and 40
 disposing the metal portion in such a way that the communication unit is not covered in a plan view seen from a direction orthogonal to the first wall. 45

50

55

Fig. 1A

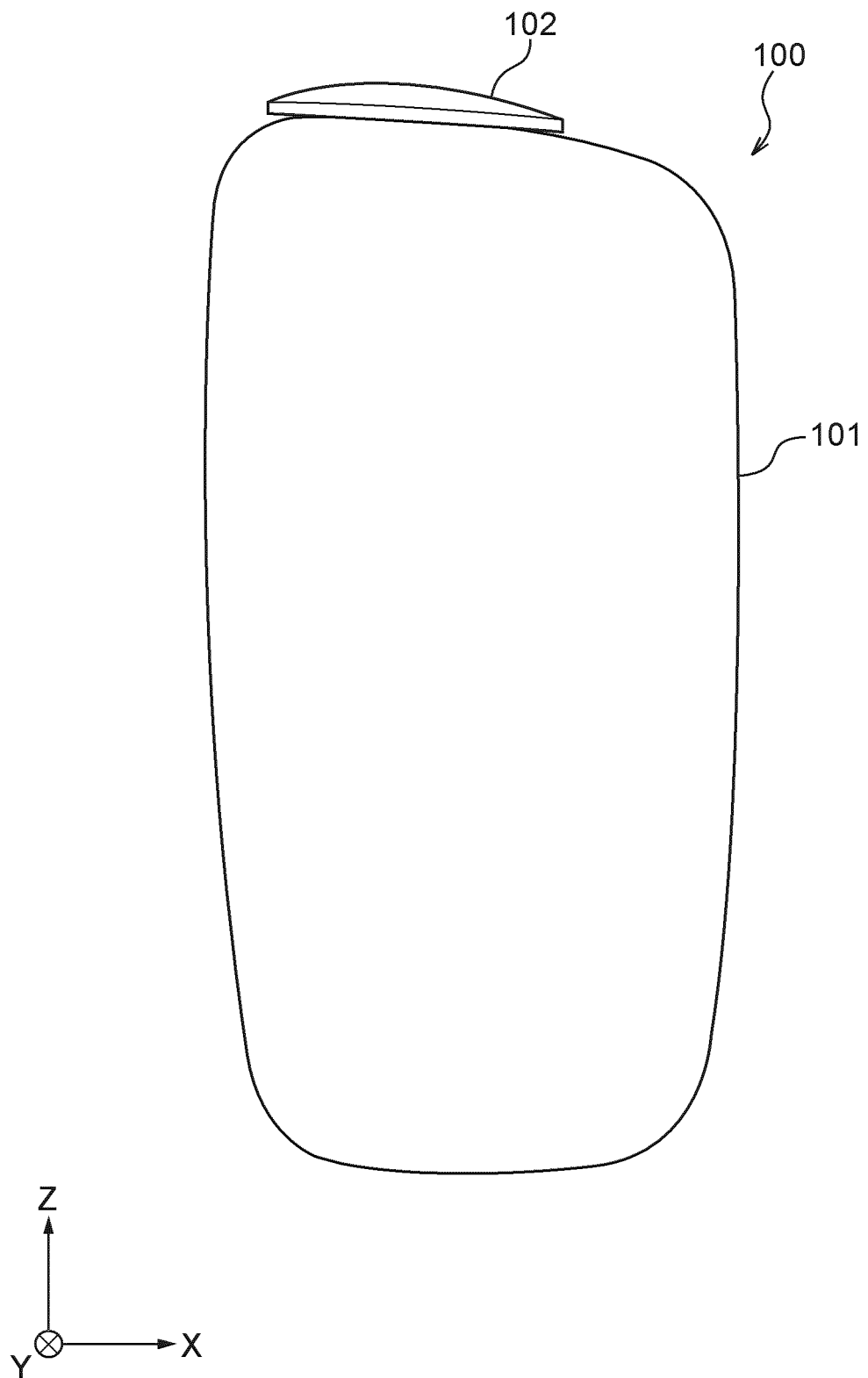


Fig. 1B

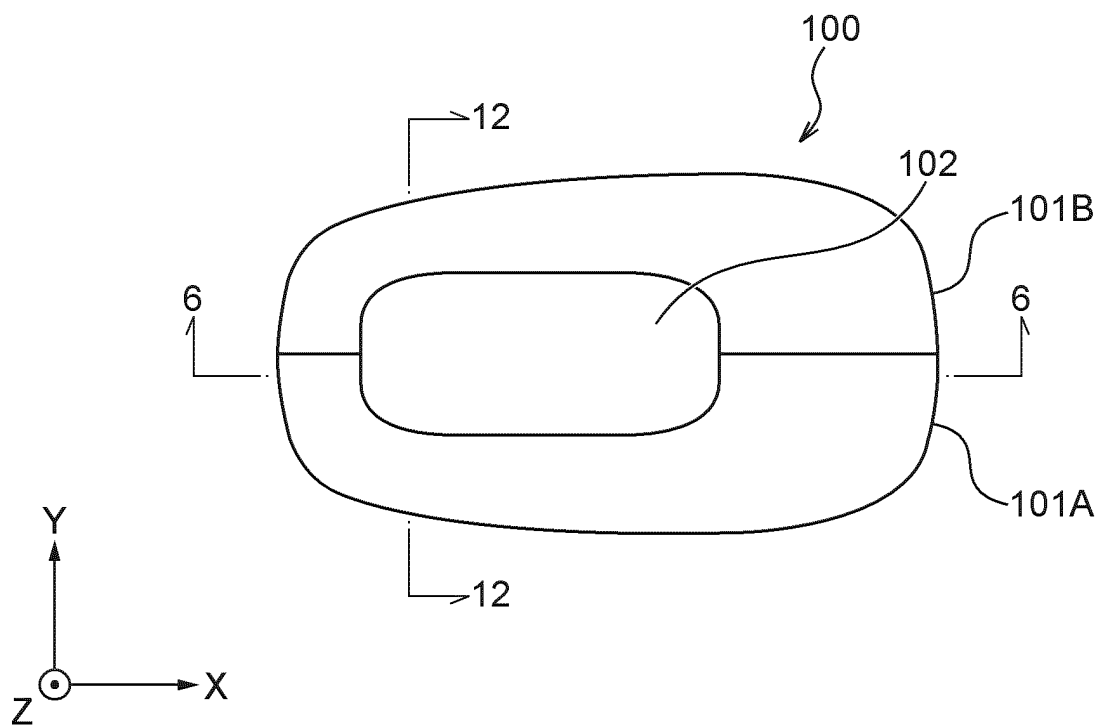


Fig. 1C

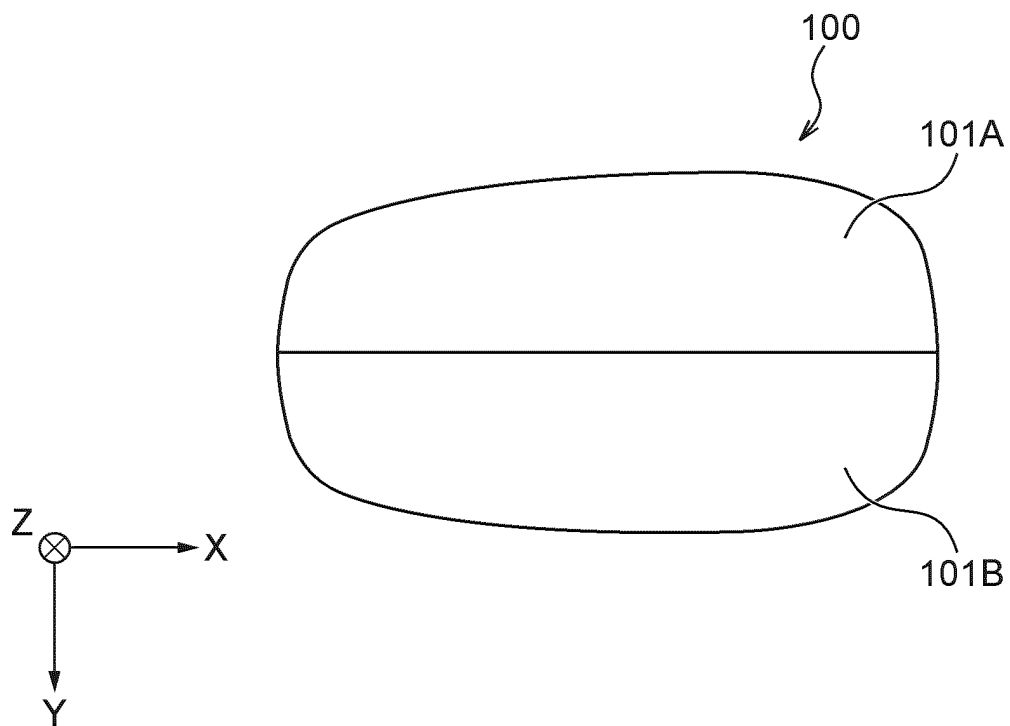


Fig. 2

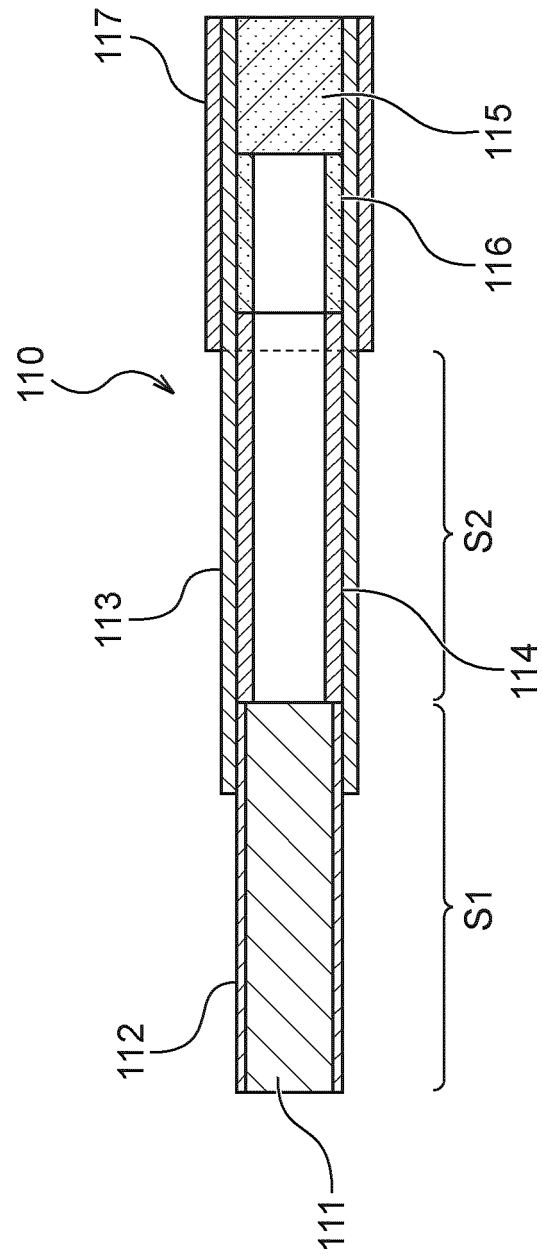


Fig. 3

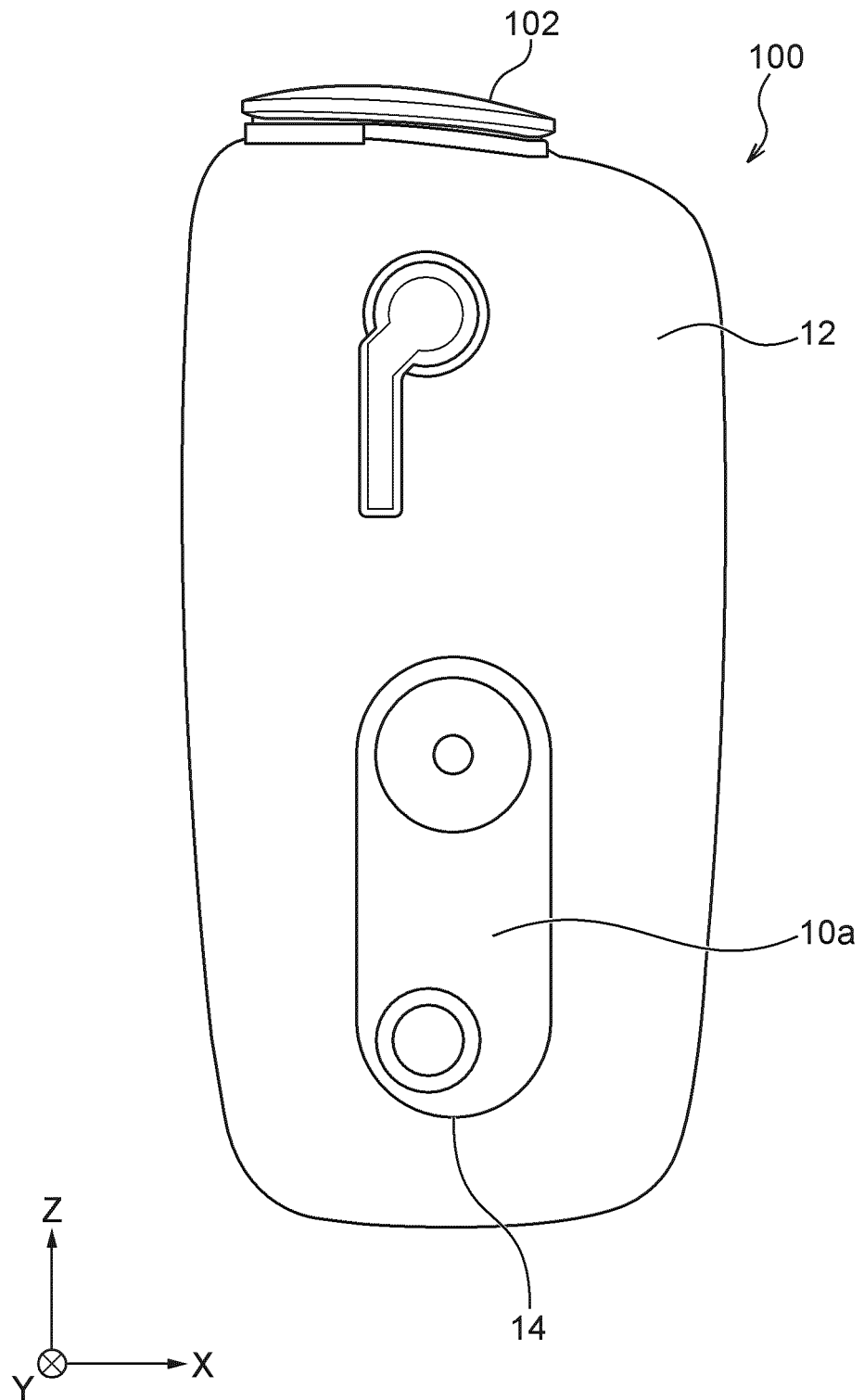


Fig. 4

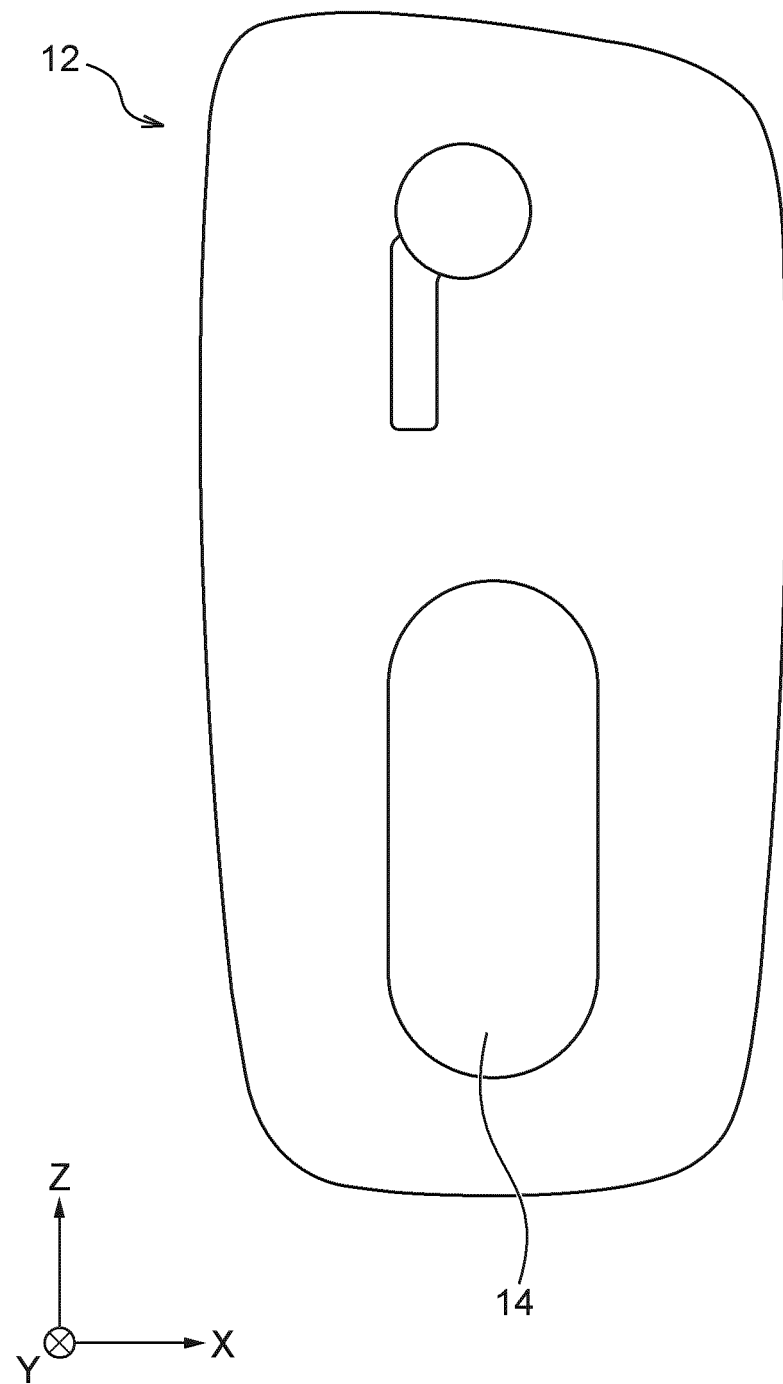


Fig. 5

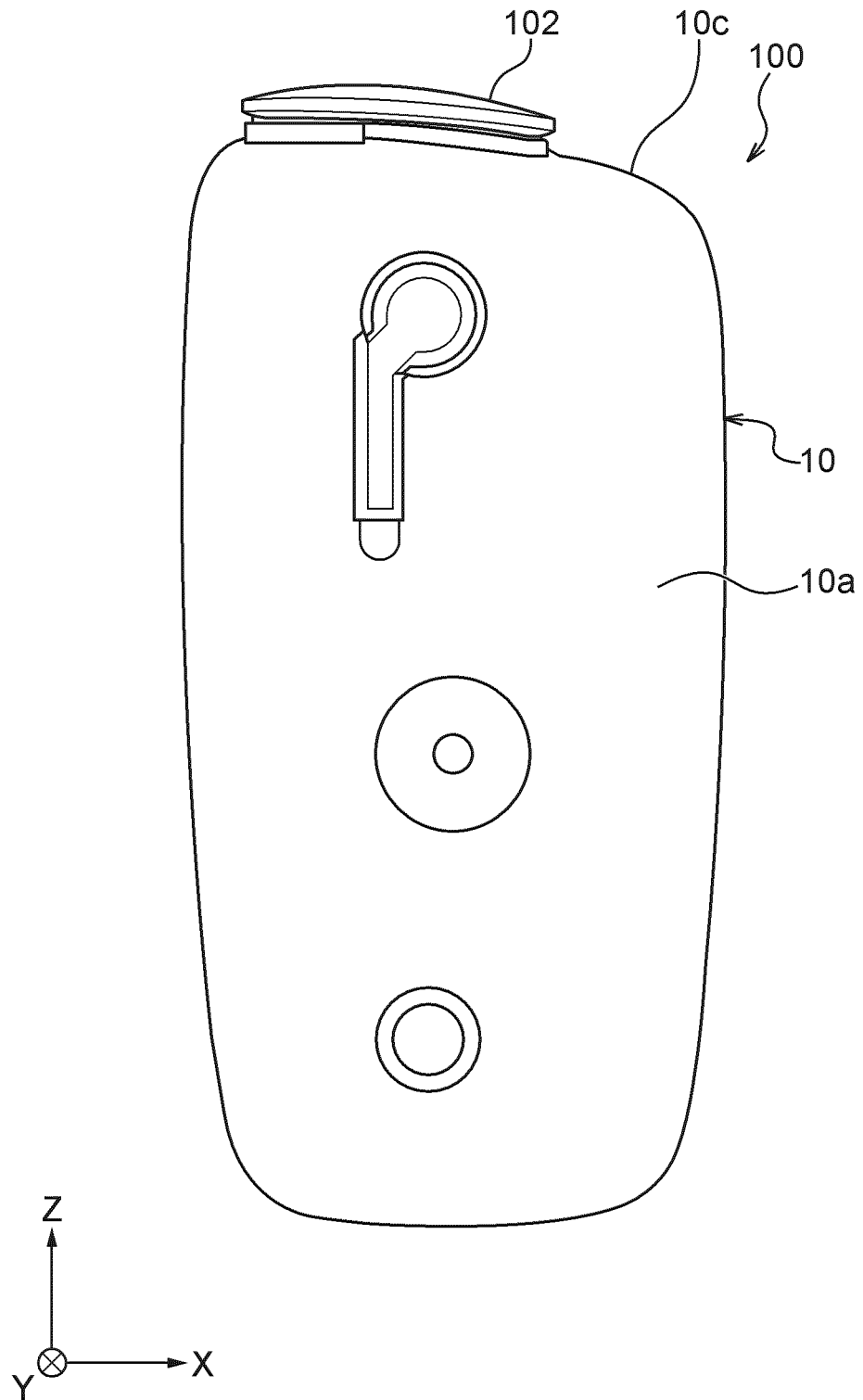


Fig. 6

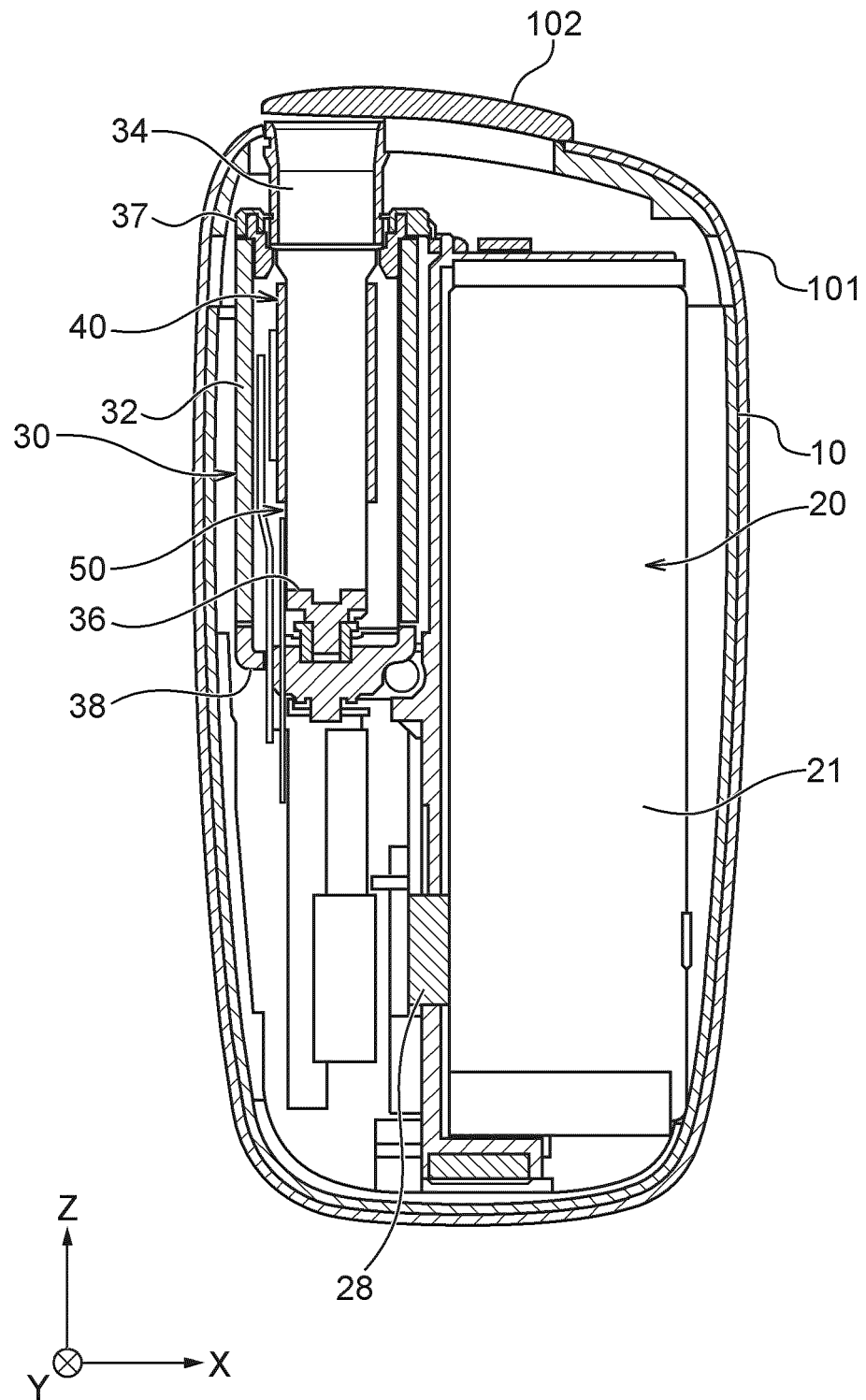


Fig. 7

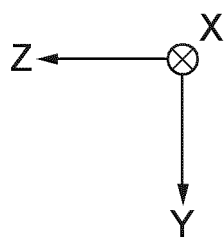
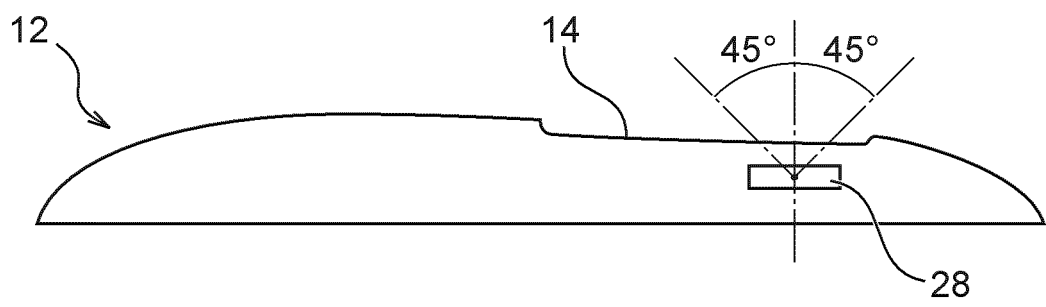


Fig. 8A

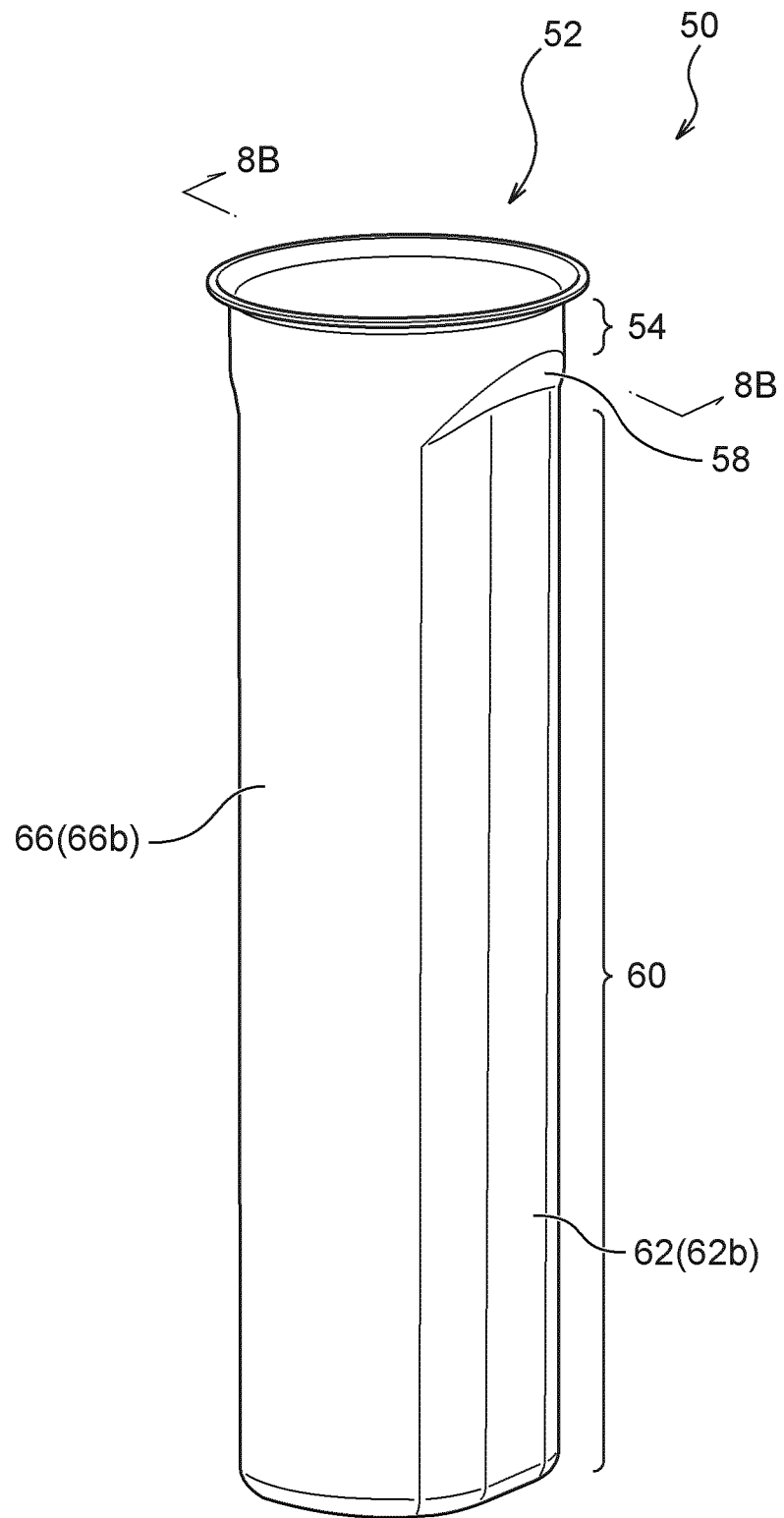


Fig. 8B

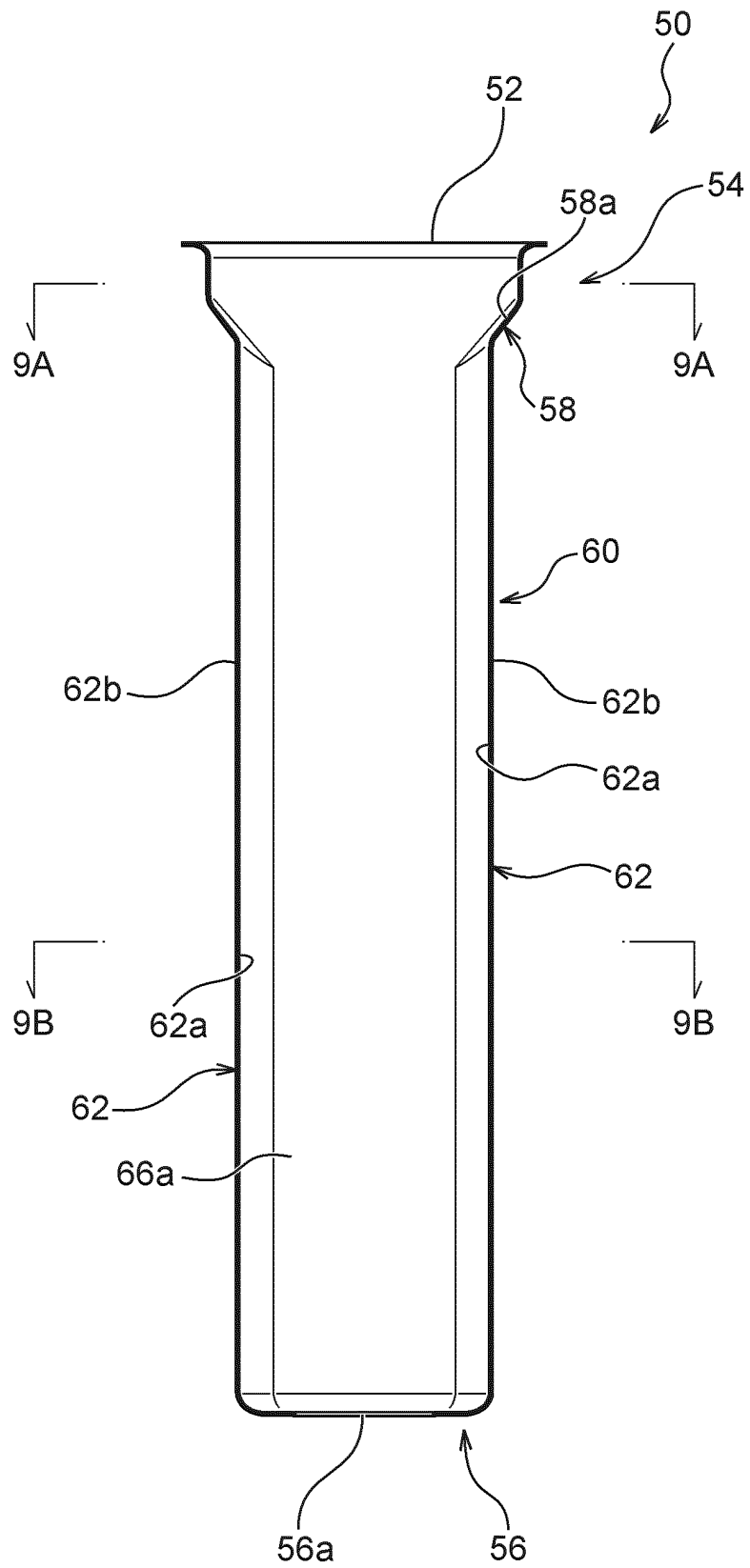


Fig. 9A

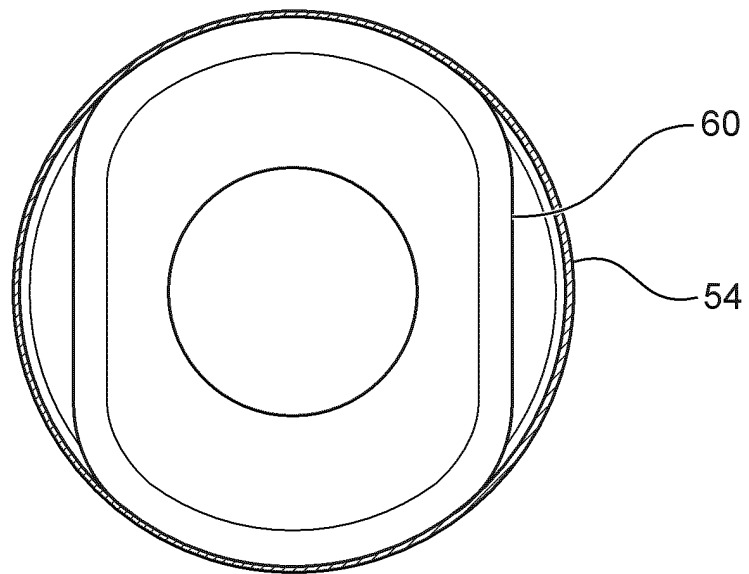


Fig. 9B

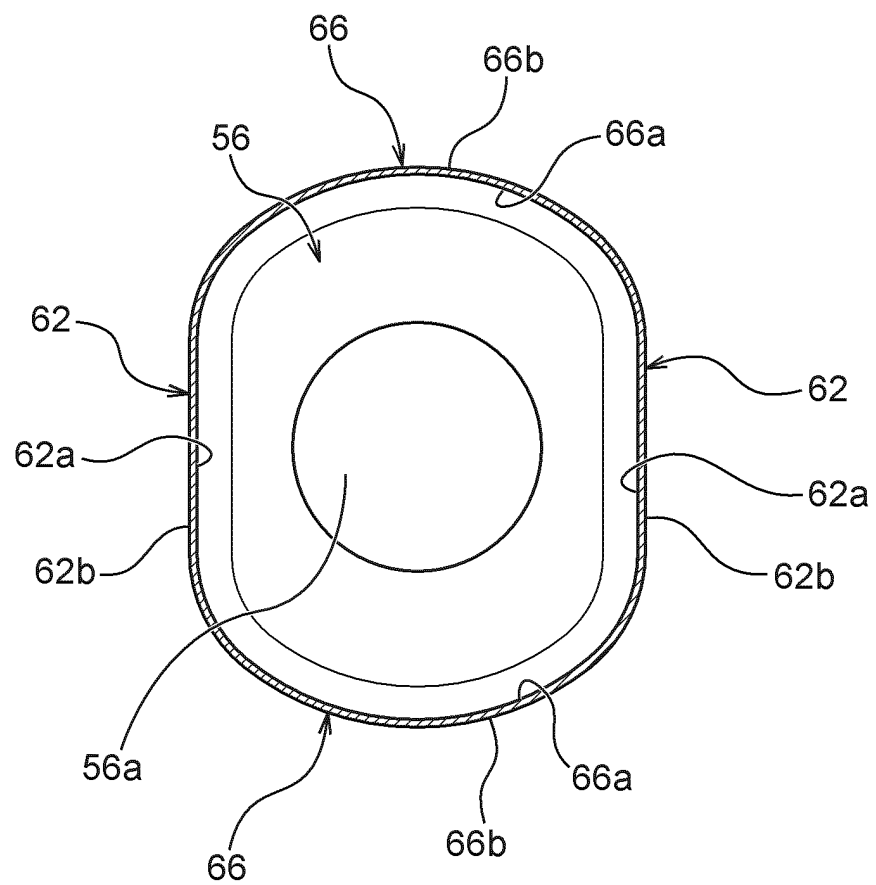


Fig. 10

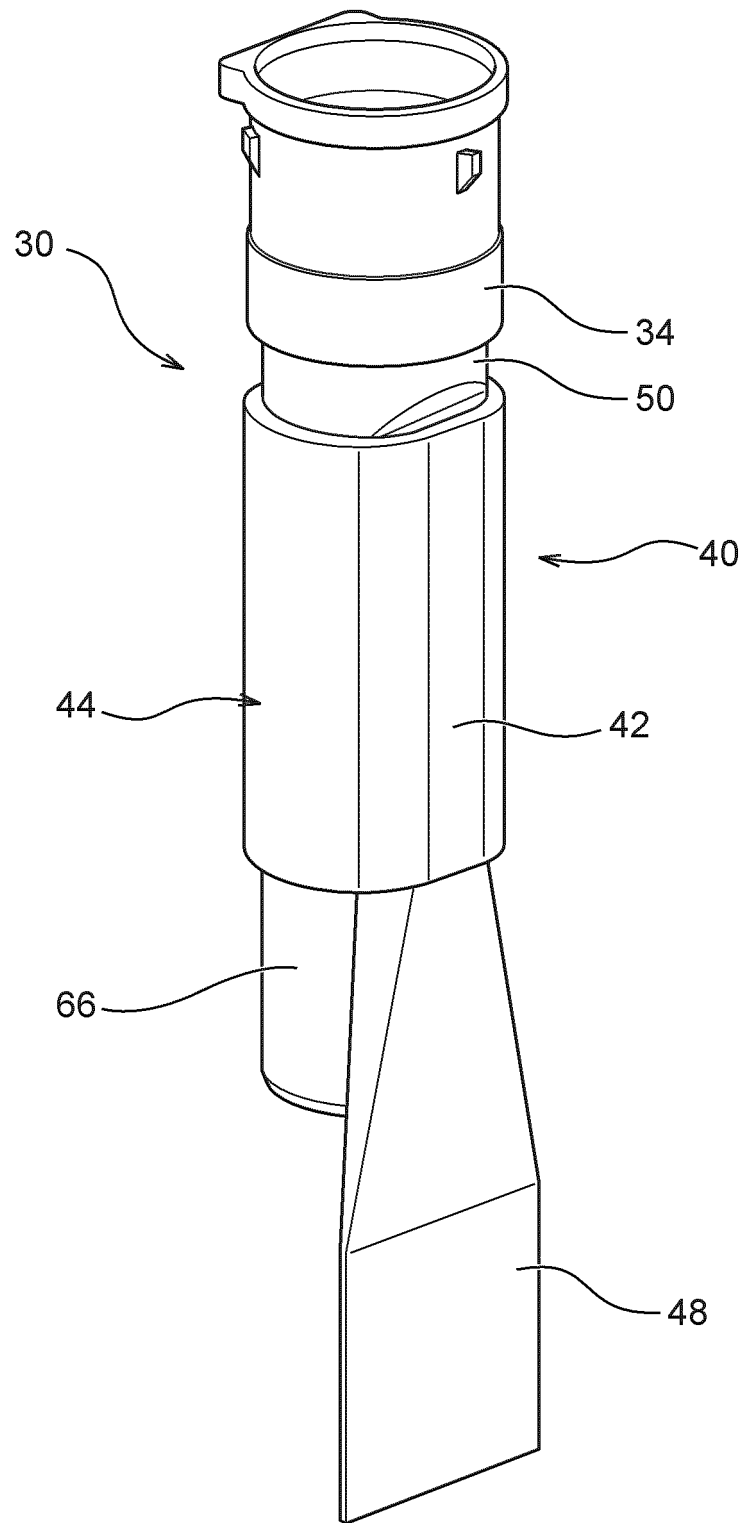


Fig. 11

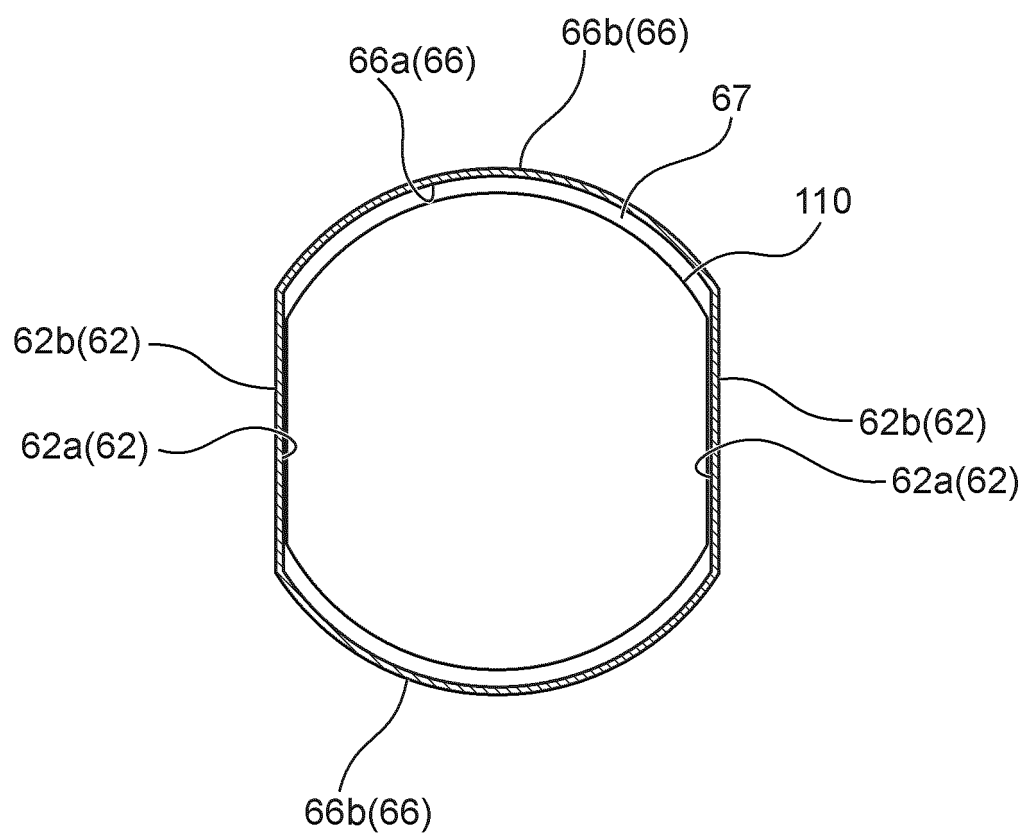


Fig. 12

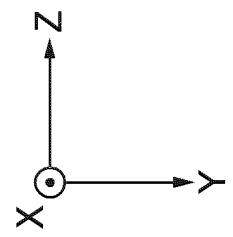
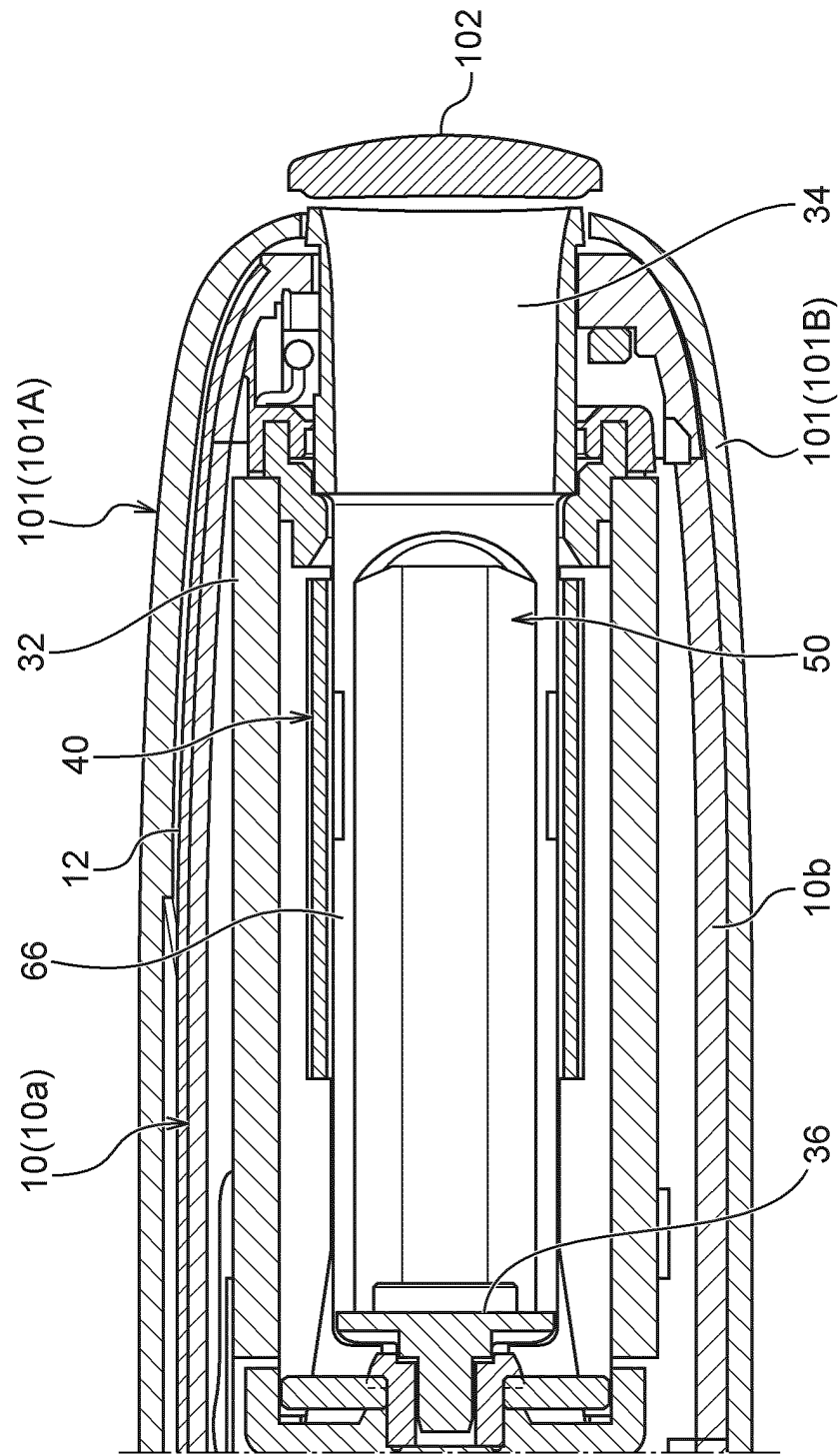


Fig. 13

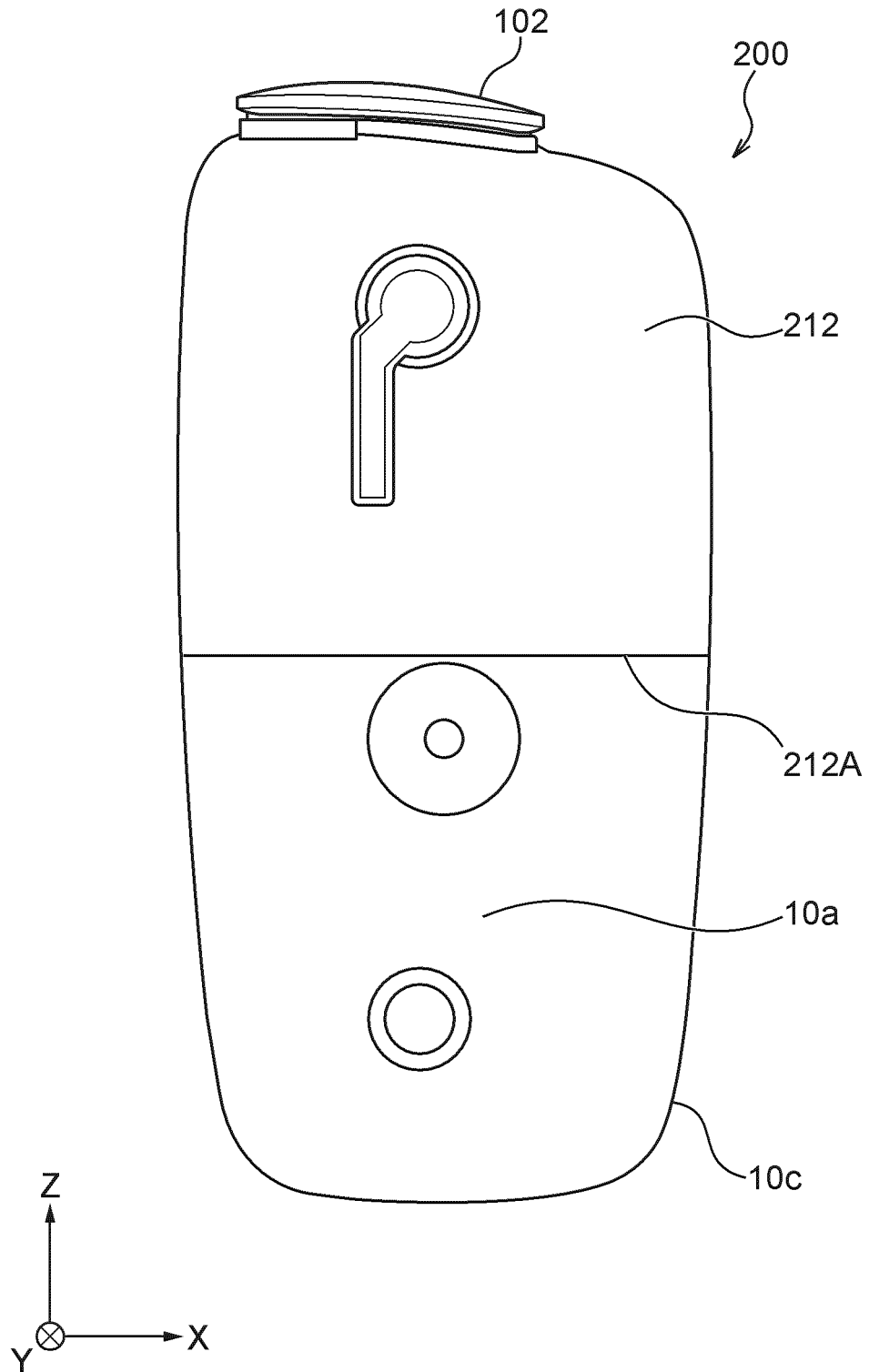


Fig. 14

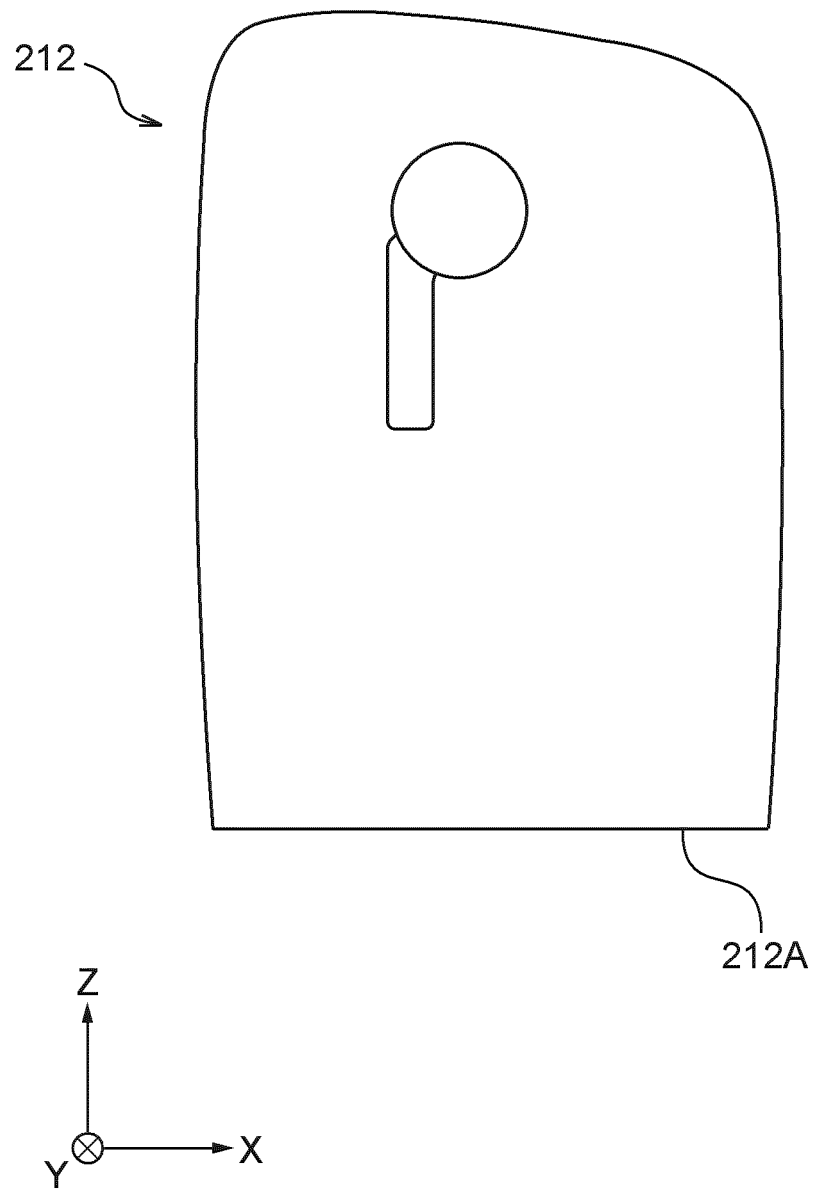
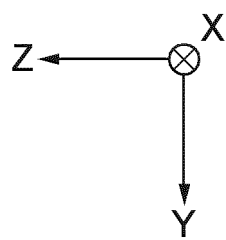
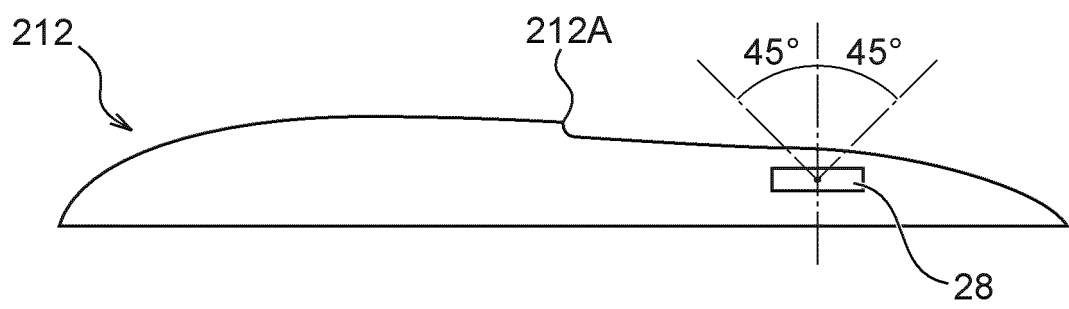


Fig. 15



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2020/046272

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/65 (2020.01) i

FI: A24F40/65

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)

A24F40/65

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2021

Registered utility model specifications of Japan 1996-2021

Published registered utility model applications of Japan 1994-2021

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2020-526208 A (KT&G CORPORATION) 31 August 2020 (2020-08-31) paragraphs [0042]-[0043], [0057], [0085], fig. 1, 4-6	1-3, 6-8
A	JP 2019-216731 A (NICOVENTURES HOLDINGS LTD.) 26 December 2019 (2019-12-26) paragraph [0033], fig. 2	1-8



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
08 January 2021 (08.01.2021)Date of mailing of the international search report
26 January 2021 (26.01.2021)Name and mailing address of the ISA/
Japan Patent Office
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/JP2020/046272

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
JP 2020-526208 A	31 Aug. 2020	US 2020/0305512 A1 paragraphs [0052]- [0053], [0067], [0095], fig. 1, 4-6 WO 2019/088382 A1 EP 3704962 A2 KR 10-2018-0124739 A CN 110691523 A	
JP 2019-216731 A	26 Dec. 2019	US 2018/0160733 A1 paragraph [0039], fig. 2 GB 2533137 A WO 2016/092259 A1 EP 3229620 A1 CA 2968927 A1 KR 10-2017-0083596 A	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2020074585 A [0003]