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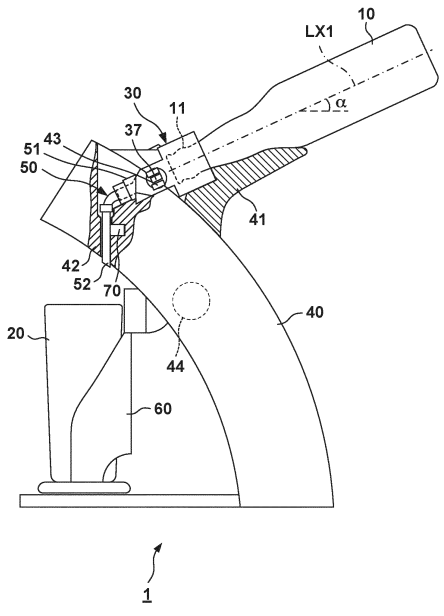
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(54) **BEVERAGE SERVER**

(57) A beverage dispenser has an arrangement which dispenses a beverage contained in a bottle into a vessel. The beverage dispenser comprises a bottle holding portion configured to hold, in a tilted state, the bottle to which a valve assembly has been attached, and a nozzle holding portion configured to hold a dispensing nozzle. The dispensing nozzle includes, on one end, a receiving port configured to receive an outlet of the valve assembly, includes, on the other end, a dispensing port, and dispenses, from the dispensing port to the vessel, the beverage that flows into the receiving port from the bottle via the valve assembly. a tilt angle of an axis of the dispensing port is larger than a tilt angle of an axis of the bottle held by the bottle holding portion.

F I G. 2



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Description

TECHNICAL FIELD

[0001] The present invention relates to a beverage dispenser.

BACKGROUND ART

[0002] As a beverage dispenser for dispensing a beverage that is contained in a small bottle such as a beer bottle into a vessel, there is a beverage dispenser that employs a method in which a dispensing nozzle is inserted into a bottle and a pressure is applied in the container of a beverage to push down the liquid level of the beverage to dispense the beverage through the dispensing nozzle.

[0003] A beverage dispenser disclosed in PTL 1 includes a main body with an open upper end, an inner lid installed on an upper portion of the main body, and an outer lid which covers the inner lid and can be put on the upper end of the main body. The inner lid includes a plurality of liquid pumping pipes, each to be inserted into a corresponding one of a plurality of beverage cans, and a beverage discharge pipe connected to the plurality of liquid pumping pipes and configured to discharge the beverage to the outside of the main body. The outer lid includes a pump for sending air to the space inside the main body and an operating member for performing an operation to switch between a beverage discharging state and a beverage non-discharging state. However, since such a beverage dispenser requires a long dispensing nozzle, it is disadvantageous in terms of maintenance such as management of sanitation and the like.

[0004] PTL 2 discloses a beverage supplying apparatus that allows a beverage to be dispensed by gravity. The beverage supplying device includes a bottle-dedicated dispensing valve which can be attached to a bottle. The bottle-dedicated dispensing valve is formed by an attachment base portion, which is to be put on a dispensing portion of a bottle, and a dispensing nozzle portion which is detachably connected to the attachment base portion. The bottle, the attachment base portion, and the dispensing nozzle portion are arranged coaxially on a vertical axis line of the bottle-dedicated dispensing valve. However, in such an arrangement, adjusting the tilt angle of the bottle to an appropriate angle will make the tilt angle of the dispensing nozzle portion inappropriate, and, on the other hand, adjusting the tilt angle of the dispensing nozzle portion to an appropriate angle will make the tilt angle of the bottle inappropriate. Thus, in either case, the beverage to be dispensed may splatter or foam up. In addition, such an arrangement can also increase the lateral dimension occupied by the beverage supplying apparatus and the bottle.

CITATION LIST

PATENT LITERATURE

[0005]

PTL 1: Japanese Patent No. 6062590
PTL 2: Japanese Patent-Laid Open No. 2018-58632

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0006] An object of the present invention is to allow a beverage to be quietly dispensed into a vessel and/or to reduce an area occupied by a beverage dispenser and a bottle.

SOLUTION TO PROBLEM

[0007] An aspect of the present invention relates to a beverage dispenser that dispenses a beverage contained in a bottle into a vessel, and the beverage dispenser comprises a bottle holding portion configured to hold, in a tilted state, the bottle to which a valve assembly has been attached, and a nozzle holding portion configured to hold a dispensing nozzle, wherein the dispensing nozzle includes, on one end, a receiving port configured to receive an outlet of the valve assembly, includes, on the other end, a dispensing port, and dispenses, from the dispensing port to the vessel, the beverage that flows into the receiving port from the bottle via the valve assembly, and a tilt angle of an axis of the dispensing port is larger than a tilt angle of an axis of the bottle held by the bottle holding portion.

ADVANTAGEOUS EFFECTS OF INVENTION

[0008] According to the present invention, a time required until the start of dispensing of a beverage can be shortened, a beverage can be quietly dispensed, and/or an area occupied by a beverage dispenser and a bottle can be reduced.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

Fig. 1 is a side view showing the arrangement of a beverage dispenser according to an embodiment;
Fig. 2 is a side view (partly a sectional view) showing the arrangement of the beverage dispenser according to the embodiment;
Fig. 3A is a view showing the arrangement of a valve assembly and a dispensing nozzle of the beverage dispenser according to the embodiment;
Fig. 3B is a view showing the arrangement of the valve assembly and the dispensing nozzle of the

beverage dispenser according to the embodiment;
Fig. 4A is a view showing the arrangement of the valve assembly and the dispensing nozzle of the beverage dispenser according to the embodiment;
Fig. 4B is a view showing the arrangement of the valve assembly and the dispensing nozzle of the beverage dispenser according to the embodiment;
Fig. 5 is a view showing the arrangement of the dispensing nozzle according to the embodiment;
Fig. 6A is a view showing the arrangement of the dispensing nozzle according to the embodiment; and
Fig. 6B is a view showing the arrangement of the dispensing nozzle according to the embodiment.

DESCRIPTION OF EMBODIMENTS

[0010] Embodiments will be described in detail hereinafter with reference to the accompanying drawings. Note that the following embodiments are not intended to limit the scope of the appended claims, and not all of the combinations of features described in the embodiments are necessarily essential to the present invention. Two or more of a plurality of features described in the embodiments may be arbitrarily combined. In addition, the same reference numerals denote the same or similar components, and a repetitive description thereof will be omitted.

[0011] Figs. 1 and 2 are side views each showing the arrangement of a beverage dispenser 1 according to an embodiment. Fig. 2 is a view in which a part of the beverage dispenser 1 has been cut out, and a portion shaded with diagonal lines shows the sectional arrangement. Figs. 3A, 3B, 4A, and 4B show the arrangement of a valve assembly 30 and a dispensing nozzle 50 of the beverage dispenser 1. Figs. 4A and 4B each show a view in which a part of the valve assembly 30 has been cut out, and a portion shaded with diagonal lines shows the sectional arrangement. Figs. 5, 6A, and 6B show the arrangement of the dispensing nozzle 50.

[0012] A beverage contained in a bottle 10 is dispensed into a vessel 20 by the beverage dispenser 1 by using gravity that acts on the beverage. The term "bottle" is to be broadly interpreted, and the material forming the bottle 10 is not limited to a specific material. The bottle 10 can be made of, for example, glass, plastic, a metal, wood, paper, or a mixed material obtained by combining two or more of these materials. The beverage can be a carbonated beverage such as beer or the like, but may also be a non-carbonated beverage.

[0013] The beverage dispenser 1 can include the valve assembly 30 and the dispensing nozzle 50. The valve assembly 30 is attached to a mouth 11 of the bottle 10. As shown in Figs. 4A and 4B, the valve assembly 30 can include a valve 35 for controlling the dispensing of the beverage from the beverage dispenser 1. Also, as shown in Figs. 2, 3A, and 3B, the valve assembly 30 can include an operating portion 37 for opening and closing the valve 35. As shown in Fig. 5, a receiving port (inlet) 51 for receiving an outlet 31 of the valve assembly 30 is included on one end and a dispensing port (outlet) 52 can be included on the other end of the dispensing nozzle 50. The dispensing nozzle 50 can dispense the beverage, which flows from the bottle 10 into the receiving port 51 via the valve assembly 30, from the dispensing port 52 into the vessel 20.

[0014] The beverage dispenser 1 can include a bottle holding portion 41 and a nozzle holding portion 42. The beverage dispenser 1 can include a main body structure 40. The bottle holding portion 41 and the nozzle holding portion 42 can form a part of the main body structure 40 or be supported by the main body structure 40. The bottle 10 with the valve assembly 30 attached to the mouth 11 can be held in a tilted state by the bottle holding portion 41. In this case, a tilted state refers to a state in which an axis LX1 (for example, a center axis) of the bottle 10 is tilted with respect to a horizontal plane.

[0015] As shown in Fig. 3B, a tilt angle α of the axis LX1 of the bottle 10 is defined as an angle of the axis LX1 of the bottle 10 with respect to a horizontal plane. The nozzle holding portion 42 can hold the dispensing nozzle 50. As shown in Fig. 3B, a tilt angle β of an axis LX2 of the dispensing port 52 is defined as an angle of the axis LX2 of the dispensing port 52 with respect to a horizontal plane. The tilt angle β of the axis LX2 of the dispensing port 52 is greater than the tilt angle α of the axis LX1 of the bottle 10 held by the bottle holding portion 41. The tilt angle α of the axis LX1 of the bottle 10 and a tilt angle β of the axis LX2 of the dispensing port 52 are determined individually. This will allow the beverage contained in the bottle 10 to be dispensed quietly into the vessel 20 so that it will be advantageous in, for example, suppressing coarse bubbles from being formed in the dispensed beverage and preventing splattering during dispensing of the beverage.

[0016] In addition, if the tilt angle α of the axis LX1 of the bottle 10 and the tilt angle β of the axis LX2 of the dispensing port 52 are set to be the same and the tilt angle α (= β) is set to an appropriate angle, the lateral dimension (horizontal dimension) occupied by the bottle 10 and the beverage dispenser 1 will be large when the bottle 10 is installed in the beverage dispenser 1. In contrast, if the tilt angle β of the axis LX2 of the dispensing port 52 is greater than the tilt angle α of the axis LX1 of the bottle 10 held by the bottle holding portion 41, it will be possible to reduce the lateral dimension (horizontal dimension) occupied by the bottle 10 and the beverage dispenser 1 while allowing the tilt angles α and β to be set to their respective appropriate tilt angles.

[0017] The tilt angle α of the axis LX1 of the bottle 10 held by the bottle holding portion 41 can be 20° or more and 45° or less or, more preferably, 25° or more and 30° or less. Such tilt angle α will be advantageous in preventing the beverage from remaining in the bottle 10 and reducing a pressure change (for example, a change in a pressure that acts on the beverage in the valve assembly 30 or a change in a pressure that acts on the beverage in a curved portion 531 (to be described later)) due to a

reduction in the liquid level of the beverage in the bottle 10 during dispensing. Reducing the pressure change will make it easier to design the dispensing nozzle 50 so as to prevent foaming and splattering of the beverage to be dispensed.

[0018] The tilt angle β of the axis LX2 of the dispensing port 52 is preferably 70° or more and 110° or less, and is most preferably 90°. Such tilt angle β is advantageous in reducing the lateral dimension (horizontal dimension) occupied by the bottle 10 and the beverage dispenser 1. Also, such tilt angle β is advantageous in reducing an impact (this impact can cause coarse bubbles to be generated) applied to the beverage while it is exiting from the dispensing port 52.

[0019] In Figs. 3A and 3B, the dispensing nozzle 50 held by the nozzle holding portion 42 is shown cut out from the drawing of Fig. 1 for the sake of descriptive convenience. That is, in reality, the dispensing nozzle 50 is held by the nozzle holding portion 42 and incorporated in the beverage dispenser 1. As shown in Figs. 3A and 3B, the bottle 10 can be arranged in the bottle holding portion 41 so that the outlet 31 of the valve assembly 30 attached to its mouth 11 is inserted into the receiving port 51.

[0020] The beverage dispenser 1 can include a valve driving mechanism (not shown) for driving the valve 35 of the valve assembly 30. The valve driving mechanism includes, as exemplified in Fig. 2, an engaging portion 43 that engages with the operating portion 37 of the valve assembly 30, and the operating portion 37 can engage with the engaging portion 43 when the bottle 10 to which the valve assembly 30 is attached is arranged in the bottle holding portion 41 (the valve 35 is in a closed state at this time). The valve driving mechanism can start the dispensing of the beverage by rotating the operating portion 37 to change the state of the valve 35 from the closed state to an open state.

[0021] As shown in Figs. 4A and 4B, the valve assembly 30 can include a fixing portion 32 to be fixed to the bottle 10, the outlet (connecting port) 31 to be connected to a tube 55, a channel forming member 34 which forms a channel 33 between the fixing portion 32 and the outlet (connecting port) 31, and the valve 35 arranged in the channel 33. The channel forming member 34 can include a vent hole 36 arranged between the valve 35 and the outlet (connecting port) 31.

[0022] As shown in Figs. 1 and 2, the beverage dispenser 1 can include a vessel holding portion 60 for holding the vessel 20 and a tilting mechanism 44 that drives the vessel holding portion 60 so as to change the tilt angle of the vessel 20 in accordance with the progress of the dispensing of the beverage contained in the bottle 10. The beverage dispenser 1 can also include an ultrasonic oscillator 70 that supplies ultrasonic waves to the beverage, which is to be dispensed from the bottle 10 to the vessel 20 via the valve assembly 30 and the dispensing nozzle 50, to generate fine bubbles in the beverage.

[0023] When a dispensing button (not shown) is pressed, the beverage dispenser 1 can start dispensing the beverage by using the tilting mechanism 44 to tilt the vessel 20 from an erect state and using the valve driving mechanism to cause the operating portion 37 to rotate to change the state of the valve 35 from the closed state to the open state. After a set time has elapsed, the beverage dispenser 1 will use the tilting mechanism 44 to make the vessel 20 return to the erect state (tilt angle = 90°) and dispense the beverage into the vessel 20 upon causing fine bubbles to generate in the beverage by operating the ultrasonic oscillator 70.

[0024] The arrangement of the dispensing nozzle 50 will be described with reference to Figs. 5, 6A, and 6B hereinafter. The dispensing nozzle 50 is used for dispensing the beverage contained in the bottle 10 into the vessel 20. The dispensing nozzle 50 can be used by being connected to the bottle 10 via the valve assembly 30 in the beverage dispenser 1, but can also be used in a state in which a user holds the bottle 10 by hand. In addition, a connecting portion for directly connecting the dispensing nozzle 50 to the bottle 10 may be provided in the dispensing nozzle 50. Furthermore, a member such as another tube member or the like may be connected to the side of the dispensing port (outlet) 52 of the dispensing nozzle 50.

[0025] The dispensing nozzle 50 can include the tube 55 which has the receiving port (inlet) 51 through which the beverage enters and the dispensing port (outlet) 52 from which the beverage exits. The dispensing nozzle 50 can also include an operating handle 511. The handle 511 can be connected to, for example, the tube 55. The tube 55 can include an upstream portion 510 on the side of the receiving port (inlet) 51, a downstream portion 520 on the side of the dispensing port (outlet) 52, and a middle portion 530 between the upstream portion 510 and the downstream portion 520. The middle portion 530 can include the curved portion 531 which forms a curve C in a channel 550 for the beverage in the tube 55.

[0026] Fig. 6A is a sectional view of a portion on the side of the upstream portion 510 in the curved portion 531, more specifically, a sectional view taken along a line A - A' of Fig. 5. Fig. 6B is a sectional view of a portion on the side of the downstream portion 520 of the curved portion 531, more specifically, a sectional view taken along a line B - B' of Fig. 5. It is preferable for a channel sectional area A1 of the portion (section A - A') on the side of the upstream portion 510 in the curved portion 531 to be smaller than a channel sectional area A2 of the portion (section B - B') on the side of the downstream portion 520 in the curved portion 531. It has been confirmed that this kind of an arrangement has an effect of reducing pulsation in which the dispensing flow rate of the beverage will change intermittently.

[0027] In a section taken by cutting a portion of the curved portion 531 along a plane perpendicular to the channel 550, more specifically, an inner surface of the curved portion 531 facing the channel 550 in Fig. 6A (the section A - A' of Fig. 5), it is preferable to have an ar-

rangement in which a radius of curvature of a first portion P1 which is closer to the inner side of the curve C is smaller than a radius of curvature of a second portion P2 which is closer to the outer side of the curve C. In other words, it is preferable for the inner surface of the curved portion 531 facing the channel 550 in Fig. 6A (the section A-A' of Fig. 5) to have an arrangement in which the curvature of the first portion P1 which is closer to the inner side of the curve C is larger than the curvature of the second portion P2 which is closer to the outer side. It has been confirmed that this kind of arrangement is highly effective in reducing pulsation. In one example, in Fig. 6A (the section A - A' of Fig. 5), the first portion PI, which is closer to the inner side of the curve C of the inner surface of the curved portion 531 facing the channel 550, can have an arc shape, and the second portion P2, which is closer to the outer side of the curve C of the inner surface of the curved portion 531 facing the channel 550, can have a linear shape. In addition, in one example, in Fig. 6A (the section A - A' of Fig. 5), the thickness of the first portion PI, which is closer to the inner side of the curve C of the inner surface of the curved portion 531 facing the channel 550, is smaller than the thickness the second portion P2, which is closer to the outer side of the curve C of the inner surface of the curved portion 531 facing the channel 550.

[0028] An angle γ formed between the direction of travel of the beverage in the channel 550 in the upstream portion 510 and the direction of travel of the beverage in the channel 550 in the downstream portion 520 can be 110° or more and 125° or less, more preferably, 115° or more and 120° or less. Such angle γ is advantageous in preventing the beverage from remaining in the bottle 10 and reducing the pressure change due to a reduction in the liquid level of the beverage in the bottle 10 during dispensing.

[0029] Although the valve assembly 30 has been described above as a component different from the dispensing nozzle 50, an aggregate of the tube 55 and the valve assembly 30 described above may also be understood to be the dispensing nozzle.

[0030] The invention is not limited to the foregoing embodiments, and various variations/changes are possible within the spirit of the invention.

REFERENCE SIGNS LIST

[0031] 1: beverage dispenser, 10: bottle, 11: mouth, 20: vessel, 30: valve assembly, 31: outlet, 32: fixing portion, 33: channel, 34: channel forming member, 35: valve, 36: vent hole, 40: main body structure, 41: bottle holding portion, 42: nozzle holding portion, 43: engaging portion, 44: tilting mechanism, 50: dispensing nozzle, 51: receiving port (inlet), 52: dispensing port (outlet), 70: ultrasonic oscillator, 510: upstream portion, 520: downstream portion, 530: middle portion, 531: curved portion, 550: channel, P1: first portion, P2: second portion, A1: channel sectional area of section taken along line A - A', A2: channel sectional area of section taken along line B - B', C: curve

Claims

1. A beverage dispenser that dispenses a beverage contained in a bottle into a vessel, **characterized by** comprising:

   a bottle holding portion configured to hold, in a tilted state, the bottle to which a valve assembly has been attached; and
   a nozzle holding portion configured to hold a dispensing nozzle,
   wherein the dispensing nozzle includes, on one end, a receiving port configured to receive an outlet of the valve assembly, includes, on the other end, a dispensing port, and dispenses, from the dispensing port to the vessel, the beverage that flows into the receiving port from the bottle via the valve assembly, and
   a tilt angle of an axis of the dispensing port is larger than a tilt angle of an axis of the bottle held by the bottle holding portion.

2. The beverage dispenser according to claim 1, **characterized in that** the tilt angle of the axis of the bottle held by the bottle holding portion is not less than 20° and not more than 35°.

3. The beverage dispenser according to claim 1, **characterized in that** the tilt angle of the axis of the bottle held by the bottle holding portion is not less than 25° and not more than 30°.

4. The beverage dispenser according to any one of claims 1 to 3, **characterized in that** the bottle is arranged in the bottle holding portion so that the outlet of the valve assembly attached to the bottle will be inserted in the receiving port.

5. The beverage dispenser according to any one of claims 1 to 4, **characterized in that** the valve assembly includes a fixing portion to be fixed to the bottle, a channel forming member forming a channel between the fixing portion and the outlet, and a valve arranged in the channel, and
   the channel forming member includes a vent hole which is arranged between the valve and the outlet.

6. The beverage dispenser according to claim 5, **characterized by** further comprising:
   a valve driving mechanism configured to drive the valve.

7. The beverage dispenser according to claim 6, **characterized in that** the valve assembly includes an

operating portion configured to open and close the valve,

the valve driving mechanism includes an engaging portion configured to engage with the operating portion, and
the operating portion engages with the engaging portion when the bottle to which the valve assembly has been attached is arranged in the bottle holding portion.

8. The beverage dispenser according to any one of claims 1 to 7, **characterized by** further comprising:

a vessel holding portion configured to hold the vessel; and
a tilting mechanism configured to drive the vessel holding portion so as to change a tilt angle of the vessel in accordance with the progress of dispensing of the beverage contained in the bottle.

9. The beverage dispenser according to any one of claims 1 to 8, **characterized in that** the dispensing nozzle includes a tube which includes an inlet configured to allow a beverage to flow in and an outlet configured to allow the beverage to flow out,

the tube includes an upstream portion on a side of the receiving port, a downstream portion on a side of the dispensing port, and a middle portion between the upstream portion and the downstream portion, and the middle portion includes a curved portion configured to form a curve in a channel for the beverage in the tube, and
a channel sectional area of a portion closer to a side of the upstream portion in the curved portion is smaller than a channel sectional area of a portion closer to a side of the downstream portion in the curved portion.

10. The beverage dispenser according to claim 9, **characterized in that** in a section taken by cutting a portion of the curved portion along a plane perpendicular to the channel, an inner surface of the curved portion facing the channel includes a first portion which is closer to an inner side of the curve and has a radius of curvature smaller than a radius of curvature of a second portion closer to an outer side of the curve.

11. The beverage dispenser according to claim 10, **characterized in that** in the section, the first portion, which is closer to the inner side of the curve of the inner surface of the curved portion facing the channel, has an arch shape, and the second portion, which is closer to the outer side of the curve of the inner surface of the curved portion facing the channel, has a linear shape.

12. The beverage dispenser according to claim 10 or 11, **characterized in that** in the section, the thickness of the first portion, which is closer to the inner side of the curve of the inner surface of the curved portion facing the channel, is smaller than the thickness of the second portion, which is closer to the outer side of the curve of the inner surface of the curved portion facing the channel.

FIG. 1

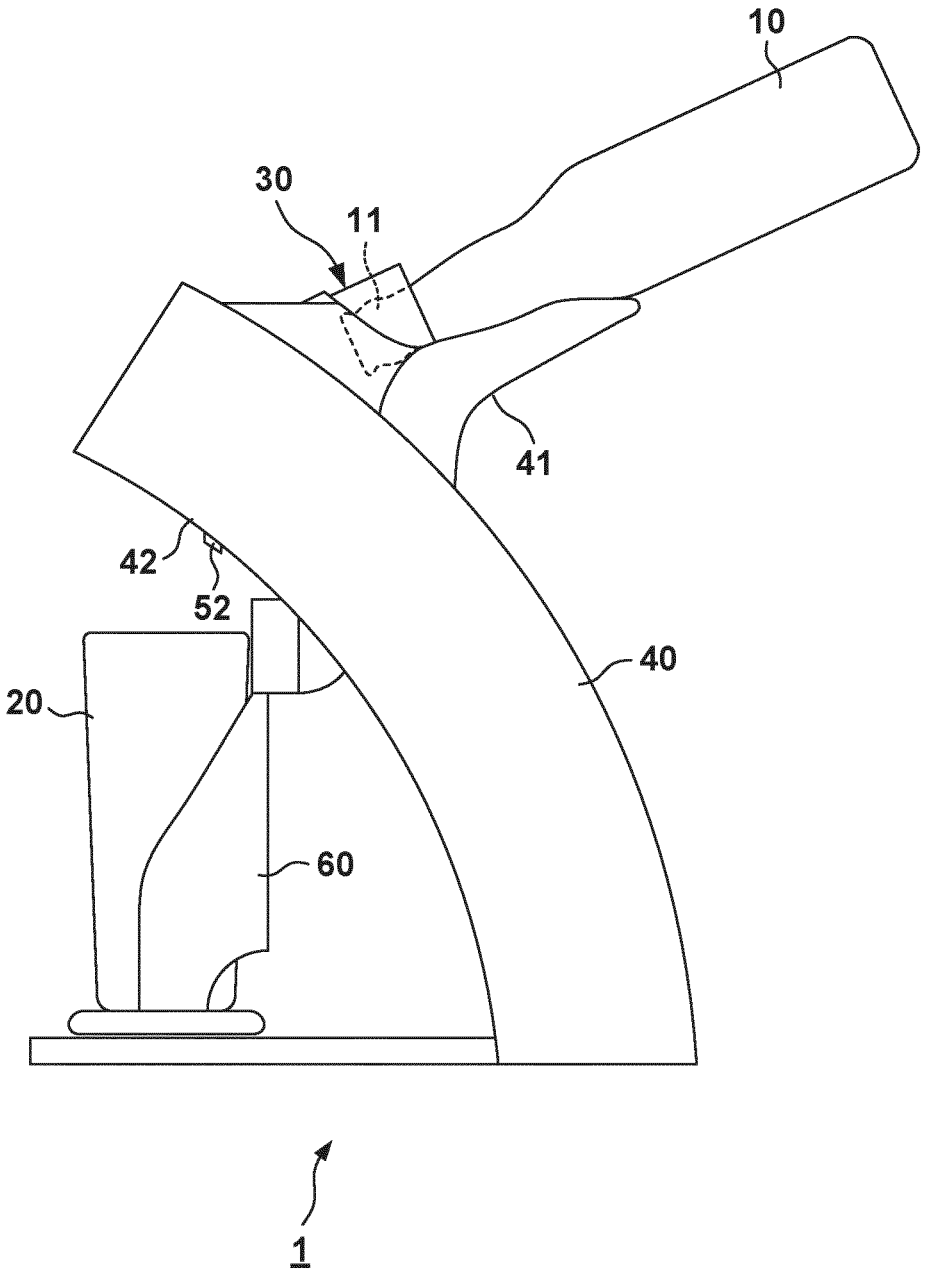


FIG. 2

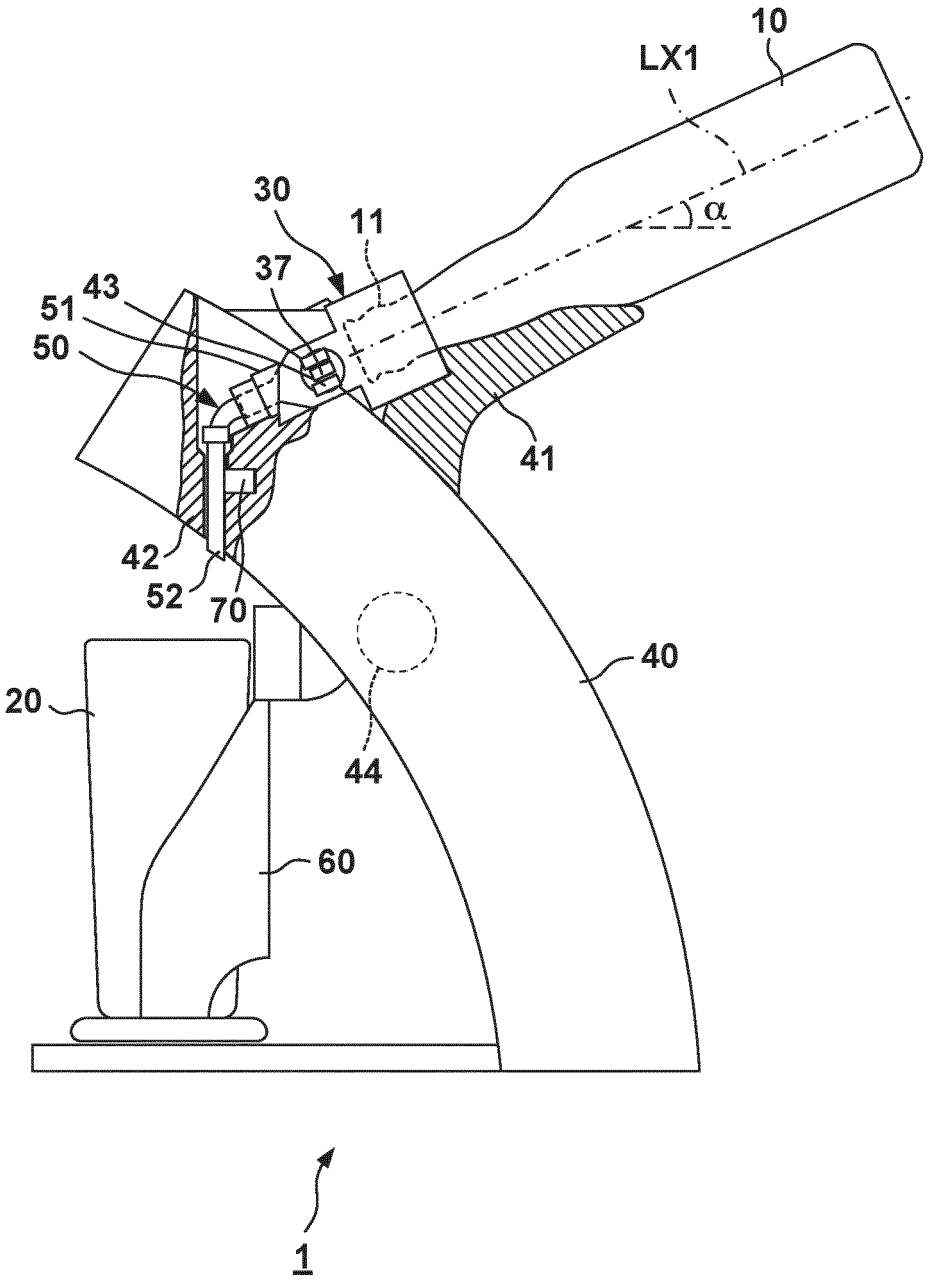


FIG. 3A

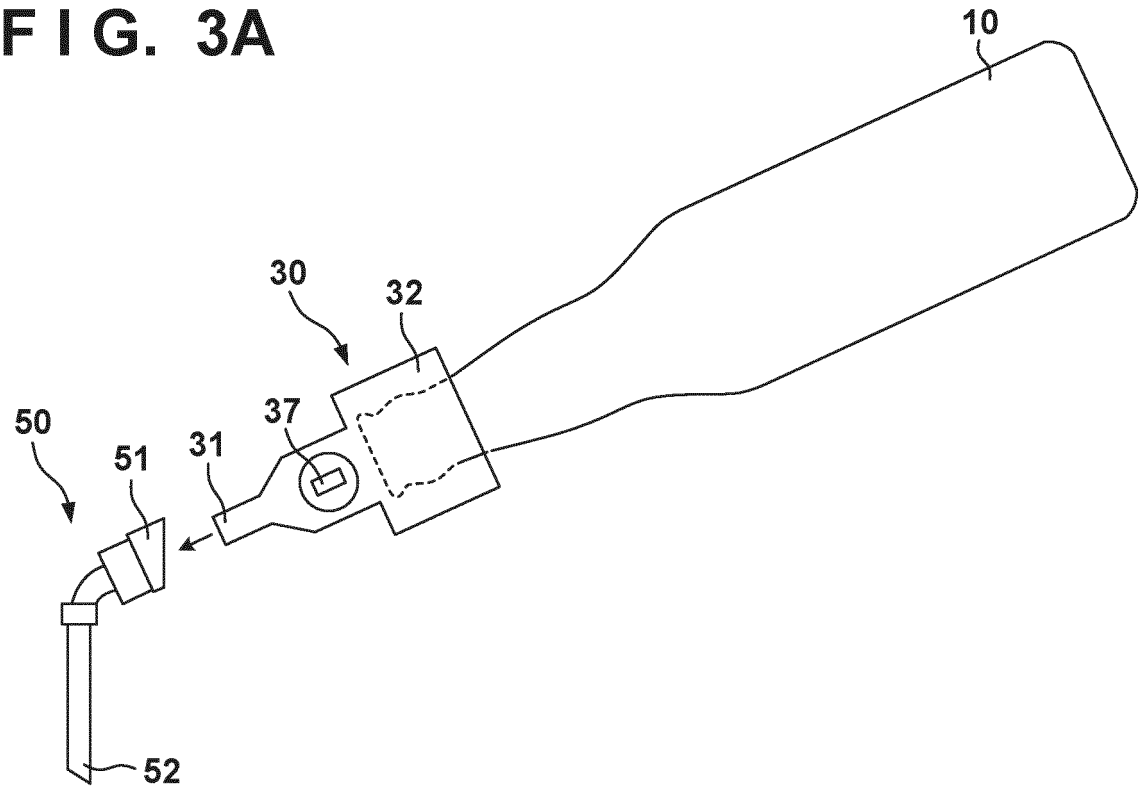


FIG. 3B

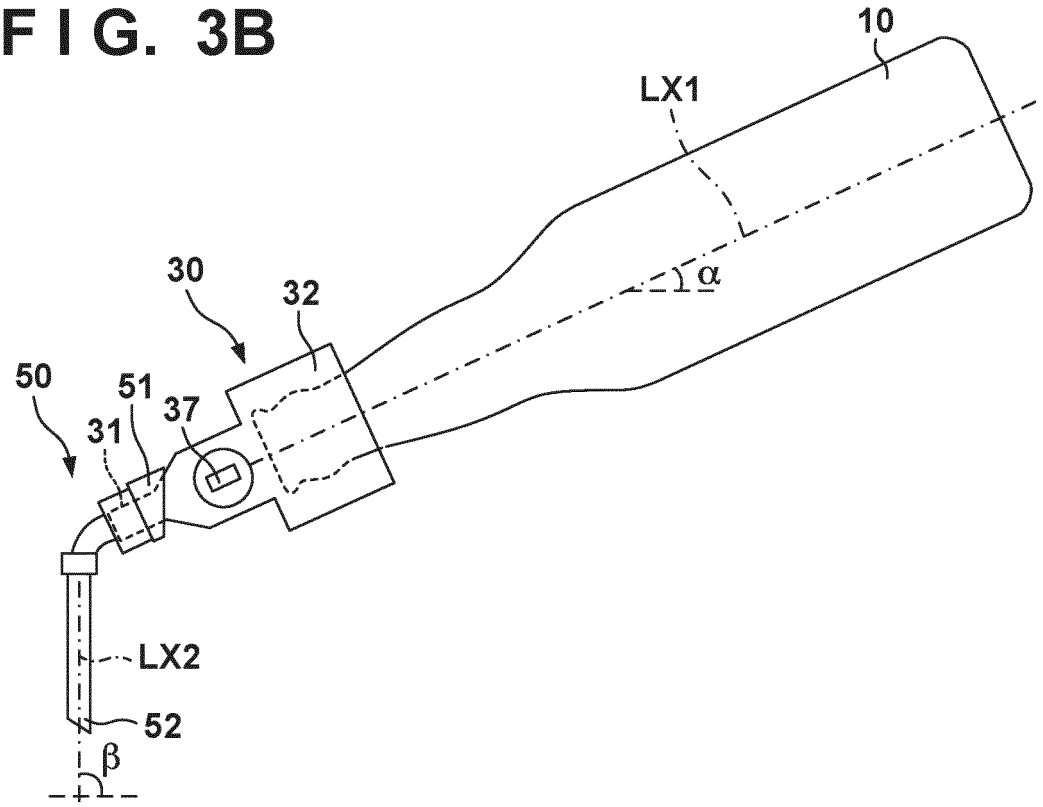


FIG. 4A

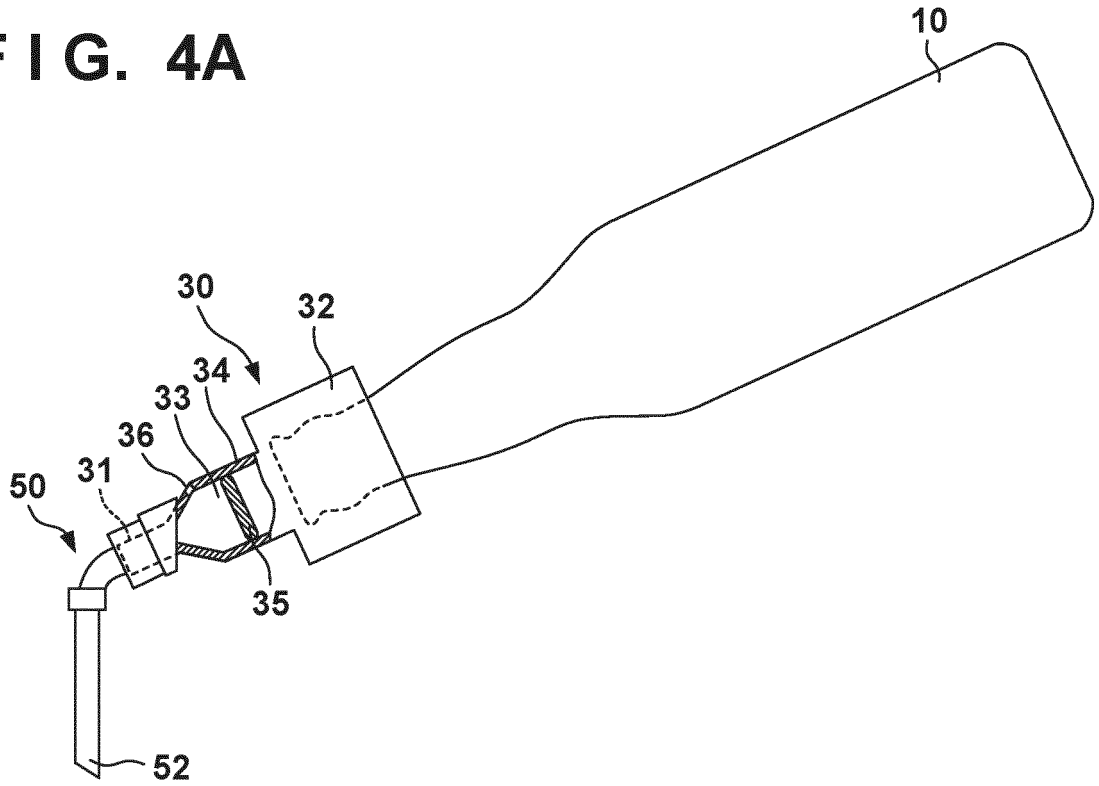


FIG. 4B

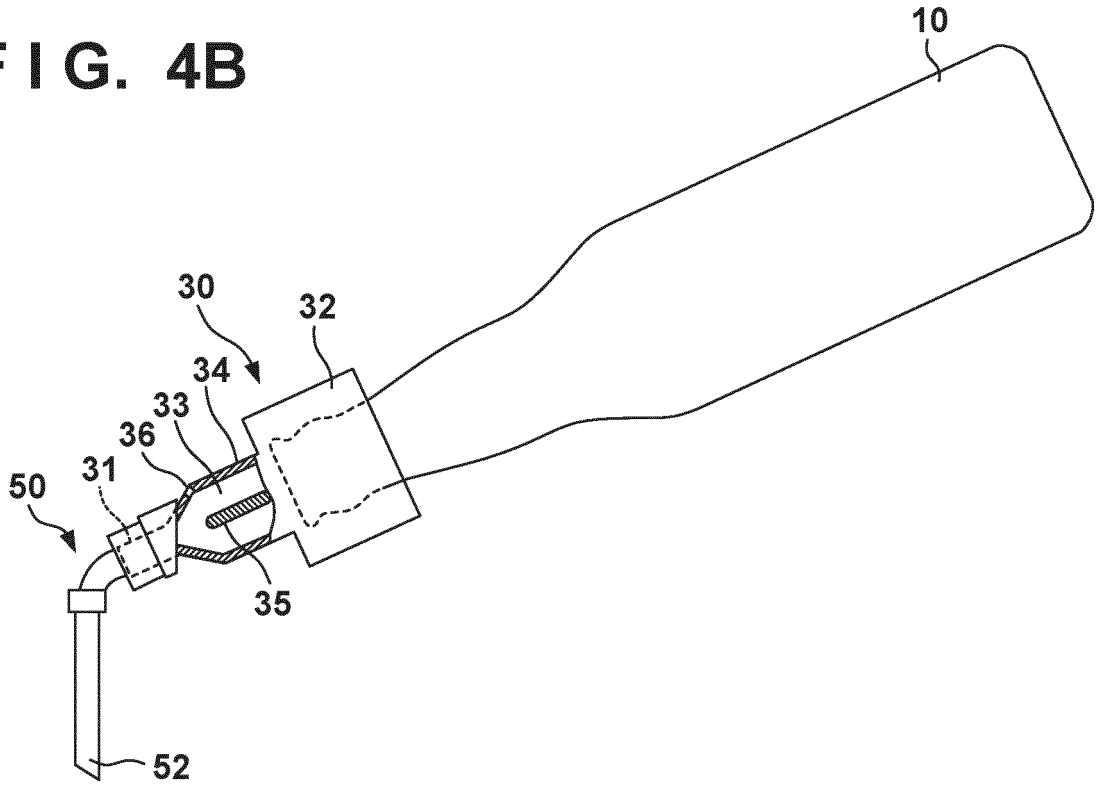


FIG. 5

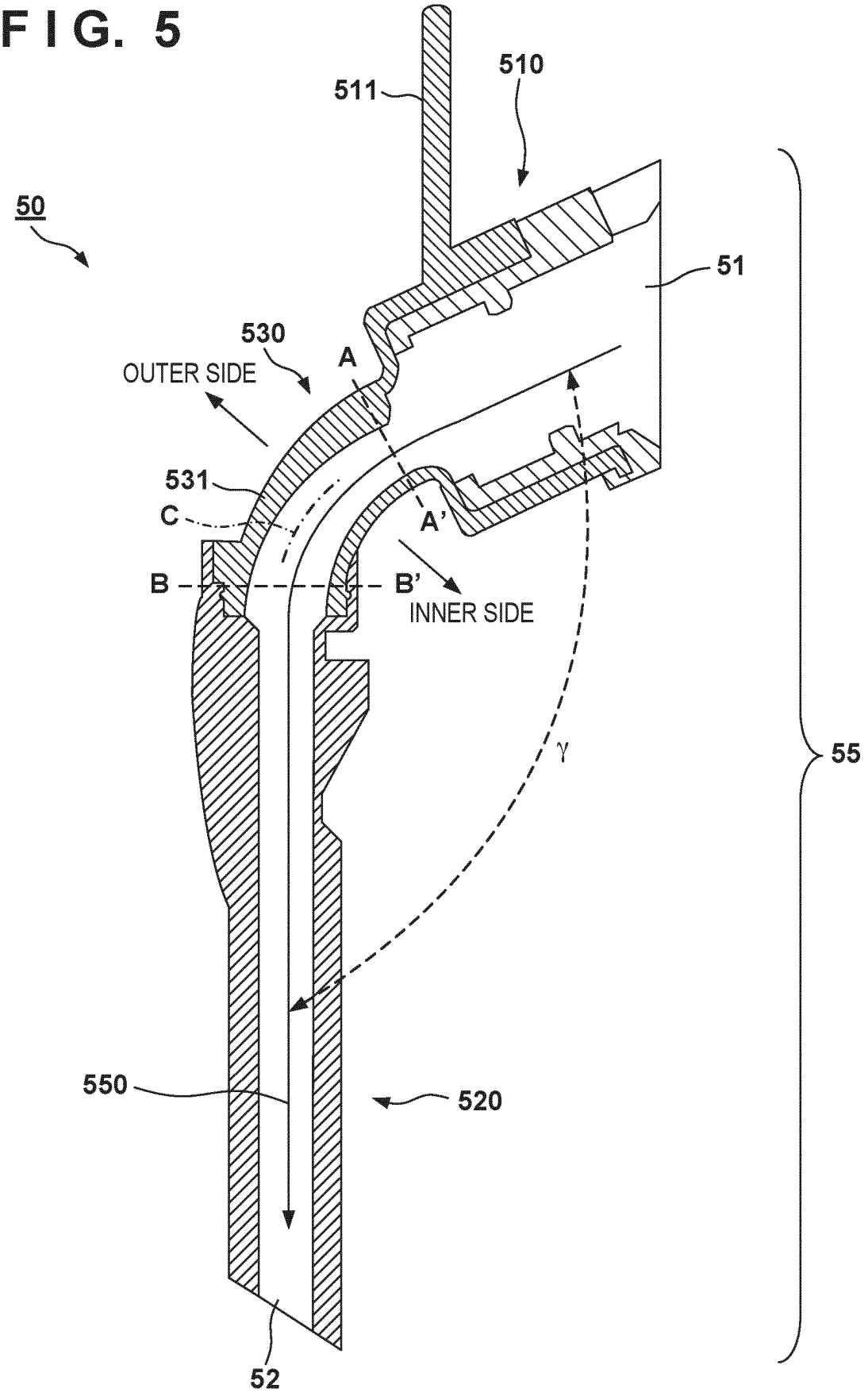

511
510
50
51
530
A
OUTER SIDE
531
C
A'
B
B'
INNER SIDE
γ
55
550
520
52

FIG. 6A

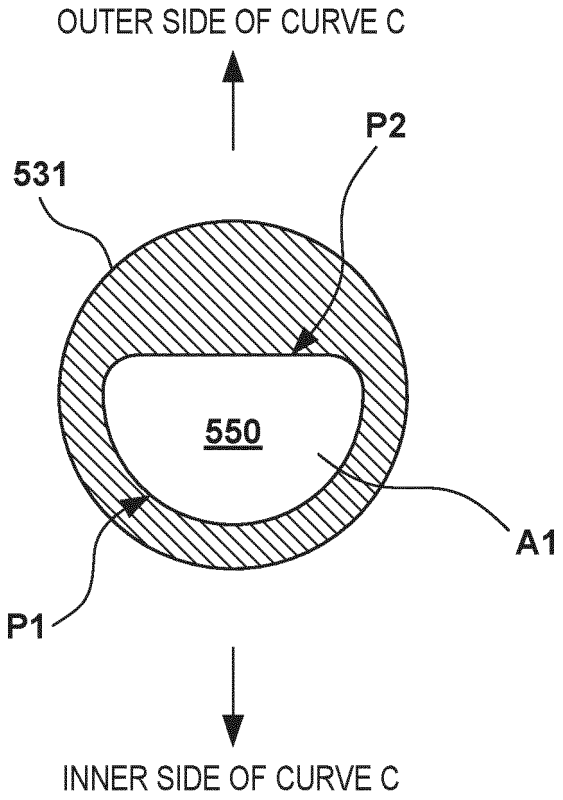
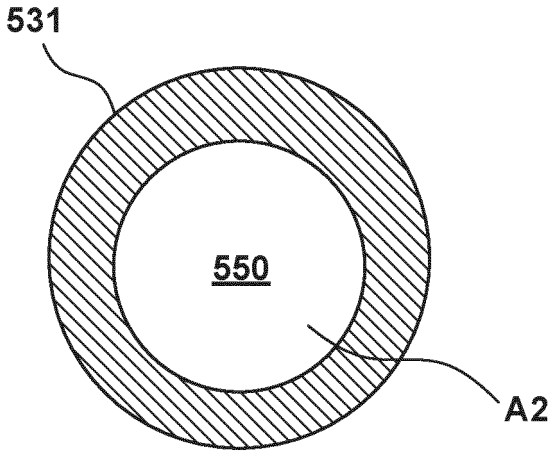

OUTER SIDE OF CURVE C
P2
531
550
A1
P1
INNER SIDE OF CURVE C

FIG. 6B


531
550
A2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2020/026269

A. CLASSIFICATION OF SUBJECT MATTER
B67D 3/00(2006.01)i
FI: B67D3/00 K

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)
B67D3/00

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

Published examined utility model applications of Japan	1922–1996
Published unexamined utility model applications of Japan	1971–2020
Registered utility model specifications of Japan	1996–2020
Published registered utility model applications of Japan	1994–2020

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 Y A	WO 2019/089674 A1 (PEPSICO, INC.) 09.05.2019 (2019-05-09) paragraphs [0031]-[0035], fig. 1-5, 8	1-6 7-8 9-12
Y	US 4664297 A (GIOVINAZZI, Thomas) 12.05.1987 (1987-05-12) column 2, line 52 to column 3, line 3, fig. 1-2	7-8
Y	JP 2000-281133 A (KIRIN BEVERAGE COMPANY, LIMITED) 10.10.2000 (2000-10-10) paragraph [0018], fig. 1-6	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
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2020/026269

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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REFERENCES CITED IN THE DESCRIPTION

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