(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 972 850 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
24.09.2008 Bulletin 2008/39

(21) Application number: **06797244.8**

(22) Date of filing: **01.09.2006**

(51) Int Cl.:
F21V 35/00 *(2006.01)* ***F21S 13/12*** *(2006.01)*

(86) International application number:
PCT/JP2006/317302

(87) International publication number:
WO 2007/072609 (28.06.2007 Gazette 2007/26)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(30) Priority: **20.12.2005 JP 2005366002**

(71) Applicant: **Tanaka Kanesuke Shoji CO., LTD**
Kobe-shi, Hyogo 6550861 (JP)

(72) Inventor: **TANAKA, Akira c/o TANAKA KANESUKE SHOUJI CO., LTD.**
Kobe-shi, Hyogo 655-0861 (JP)

(74) Representative: **Leinweber & Zimmermann**
Rosental 7
II Aufgang
80331 München (DE)

(54) CANDLE SET

(57) The present invention provides a candle apparatus which can securely, surely and simultaneously lights wicks of a plurality of candles held so as to face each other by flame of a match, lighter or the like, and generates fireworks as an opening act before the simultaneous lighting of the wicks to warm up the atmosphere of a site by enjoying watching this fireworks.

A candle apparatus is configured such that: a plurality of flower petal-like pieces 2 are supported around a support rod 1 supported by a support base 7 so as to be openable and closable in a vertical direction; when the flower petal-like pieces 2 are in a closed position, candles 5 attached to tip end portions of the flower petal-like pieces 2 lie down, and wicks 5a are held so as to face each other above the support rod; the flower petal-like pieces 2 spread out by simultaneously lighting the wicks 5; and the lit candles 5 in the open position stand on the flower petal-like pieces 2, wherein: a fuse stick 13 obtained by forming a gunpowder layer 14 containing a fireworks component around the core 13a is disposed so as to stand on the support rod; and the wicks 5a of the candles 5 are disposed so as to face each other around a portion of the gunpowder layer 14 which is close to a base portion of the fuse stick 13.

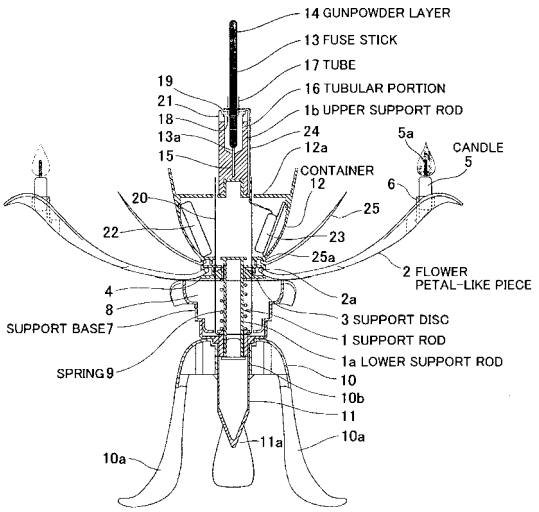


Fig. 1

EP 1 972 850 A1

Description

Technical Field

[0001] The present invention relates to a candle apparatus which can pleasantly warm up a candlelight service at, for example, a birthday party, and more particularly to a candle apparatus which can simultaneously light a plurality of candles by flame of an at-home match, lighter or the like.

Background Art

[0002] Conventionally and widely done as the candlelight service at, for example, a birthday party is to dispersively stand a plurality of candles on a cake, to light these candles, to blow out all the candle after a while, and then to cut the cake. The candles used here are stood directly on the cake. Therefore, in the case of many of the candles for cakes, a plastic pin is attached to a lower portion of each candle, or the lower portion of the candle is covered with, for example, aluminum foil.

[0003] As described above, in the case of the candlelight service of standing the candles on a cake at, for example, a birthday party, the candles standing on the cake are lit, and the atmosphere by the flame of the candles are enjoyed until the flame is blown out. Therefore, since such candlelight service ends in a very short period of time, it cannot warm up the atmosphere of the place so much.

[0004] In the past, the applicant of the present invention has proposed a candle apparatus in which: base ends of a plurality of flower petal-like pieces are supported around a support rod such that the flower petal-like pieces are openable and closable in a vertical direction; candles are attached to tip end portions of the flower petal-like pieces; when the flower petal-like pieces stand and are in a closed position, the candles of the flower petal-like pieces lie down, and wicks of the candles face each other and are maintained in this state; this state is canceled by simultaneously lighting the wicks, so that the flower petal-like pieces spread out and stay in an open position; and the lit candles stand in an upright position on the flower petal-like pieces.

[0005] In accordance with this candle apparatus, a plurality of candles are handled collectively without dispersively standing a plurality of candles on a cake, and a plurality of candles lit, followed by simultaneous opening of the flower petals, are arranged dispersively above the cake. Thus, the candle apparatus can provide good appearance and decoration and can gorgeously warm up the atmosphere of a place of, for example, a birthday party (see Patent Document 1).

[0006] However, in the above candle apparatus, in a state in which the flower petal-like pieces stand and are in the closed position, that is, in an original state, the candles lie down and horizontally spread in a radial direction, tip end portions of the wicks of the candles are held so as to get close to each other and face each other at a center portion of the candle apparatus, and tip end portions of the flower petal-like pieces standing in the closed position project upward and surround the candles.

[0007] Therefore, in the case of and simultaneously lighting a plurality of wicks facing each other directly by an at-home match, lighter or the like, a hand holding the lit match or lighter needs to be approached to the wicks from above the candles lying down, and the flame of the match or lighter needs to be put on the wicks. However, the tip end portions of the flower petal-like pieces surrounding the candles are obstructive, and how the flame burns from a plurality of wicks by the simultaneous lighting is unpredictable. Therefore, such lighting is considerably difficult.

[0008] Therefore, in the above candle apparatus, an ignition accelerator is disposed in advance below a portion where the wicks of the candles lying down in the closed position of the flower petal-like pieces face each other. Moreover, to light the ignition accelerator, an exclusive lighting stick having a length of about twice or three times the length of a normal match is separately prepared. In the case of lighting the wicks, the flame of the match, lighter or the like is once transferred to the lighting stick, the ignition accelerator is lit by the flame of the tip of the lighting stick, and all the wicks are simultaneously, instantly and surely lit by a lighting power of the ignition accelerator having a large heating value.

[0009] In the above candle apparatus, an original object of safely and securely transferring the flame of the at-home match, lighter or the like to a plurality of wicks held so as to face each other from above the candles lying down and simultaneously lighting the wicks is adequately achieved by using the lighting stick prepared in advance. However, since the lighting stick is used just to securely, surely and simultaneously light a plurality of wicks, an operation itself of transferring the flame of the lighting stick to the wicks is nondescriptive and unamusing. Therefore, the candle apparatus is enjoyed by watching the movement of spreading-out of the flower petal-like pieces after simultaneously lighting a plurality of wicks and the movement of the candles lit on the flower petal-like pieces.

Patent Document 1: Japanese Laid-Open Patent Application Publication No. 2004-200136

Disclosure of the Invention

Problems to be Solved by the Invention

[0010] The present invention was made under these circumstances, and an object of the present invention is to provide a candle apparatus which can securely, surely and simultaneously light wicks of a plurality of candles held so as to face each other directly by flame of a match, lighter or the like and can warm up the atmosphere of a site by generating fireworks for watching and enjoyment on the candle apparatus as an opening act before simul-

taneously lighting the wicks.

Means for Solving the Problems

[0011] To achieve the above object, a candle apparatus according to the present invention is configured such that base ends of a plurality of flower petal-like pieces are supported around a support rod such that the flower petal-like pieces are openable and closable in a vertical direction, the support rod having a lower portion supported by a support base such that the support rod is movable upward and downward; candles are attached to tip end portions of the flower petal-like pieces; when the flower petal-like pieces stand and are in a closed position, the candles of the flower petal-like pieces lie down, and wicks of the candles face each other above the support rod and are maintained in this state; this state is canceled by simultaneously lighting the wicks, so that the flower petal-like pieces spread out and stay in an open position; and the lit candles stand in an upright position on the flower petal-like pieces, wherein: a fuse stick obtained by forming a gunpowder layer containing a fireworks component around a core is disposed so as to stand on the support rod; and the wicks of the candles are disposed so as to face each other around a portion of the gunpowder layer which is close to a base portion of the fuse stick.

[0012] In order that the wicks of the candles are held so as to face each other, the wicks may be directly adhered to each other by using a combustible adhesive or the like.

[0013] In accordance with the candle apparatus according to the present invention configured as above, in the case of setting (standing) the candle apparatus on an appropriate position of, for example, a cake and lighting the gunpowder layer at an upper end of the fuse stick projecting upward from the candle apparatus by flame of a match, lighter or the like, the gunpowder layer starts burning, a fireworks generating component in the gunpowder layer reacts by this burning, and sparks spattering around the fuse stick become beautiful fireworks. Thus, the gunpowder layer keeps burning. As a burning point (origin of fire) of the gunpowder layer approaches to a position where the wicks of the candles face each other, sparks newly generated from the burning point fall on the wicks of the candles lying down around the gunpowder layer, so that the wicks are preheated. After the burning point gets close to the position where the wicks face each other, tip end portions of the heated wicks get in the sparks newly generated at an outer peripheral portion of the burning point, and all the wicks are simultaneously lit. At the same time, the held wicks are separated from each other, and the flower petal-like pieces simultaneously spread out from the closed position and are settled in the open position. Thus, the lit candles stand at the tip end portions of the flower petal-like pieces.

[0014] Therefore, in accordance with the present invention, since the lighting of a plurality of candles is carried out using the fuse stick attached to the candle apparatus, and the beautiful fireworks can be seen around the fuse stick while the gunpowder layer of the fuse stick is burning, this fireworks is attractive, increase visual gorgeousness of the apparatus, and pleasantly warms up the atmosphere as an opening act. The gunpowder layer keeps burning, the sparks newly generated from the burning point preheat the wicks lying down, and thus the wicks of the candles are simultaneously lit by the sparks generated when the burning point approaches to the wicks most. Therefore, the wicks of the candles are simultaneously lit securely and surely.

[0015] The movement of the flame of the candles when the flower petal-like pieces simultaneously spread out after the held wicks are separated from each other is similar to, in a sense, a dynamic movement that is just like a movement from the lighting of the fireworks to the beautiful spreading of the fireworks. Thus, the movement of the flame makes an amusing atmosphere, is highly decorative, and can gorgeously warm up the atmosphere of a site, such as a birthday party.

[0016] In the above configuration, a highly combustive tube covers the fuse stick while retaining a certain degree of play between the highly combustive tube and the fuse stick, so as to correspond to a position where the wicks of the candles face each other, and a base portion of the highly combustive tube is supported by an upper end of the support rod via heat shielding means. With this configuration, to simultaneously light the wicks of the candles, the gunpowder layer keeps burning, and the burning point of the gunpowder layer approaches to the highly combustive tube. When the highly combustive tube is lit by the generated sparks, the tube is instantly burned out and generates flame around the fuse stick. The wicks of the candles are simultaneously lit by the flame. Therefore, in this case, the flame generated when the highly combustive tube is instantly burned out is surprising and attractive.

[0017] The heat shielding means at the base portion of the tube suppress an abnormality of, for example, burning the tube supporting portion of a plastic support rod by the flame or high heat generated while the highly combustive tube is being burned out.

[0018] In the above configuration, as practical heat shielding means, it is preferable that the heat shielding means include a receiving member having a tubular portion to be inserted into the base portion of the highly combustive tube and a flange formed at a lower end of the tubular portion, and a heat shielding ring which covers the highly combustive tube on the receiving member. Moreover, to support these at an upper end of the support rod, the core is exposed at a lower portion of the fuse stick; this exposed portion of the core is detachably inserted into a support hole formed at a center of the support rod such that the fuse stick is supported by the support rod; a tubular portion is formed so as to extend on the support rod; with a support hole positioned in the tubular portion, a base portion of the gunpowder layer is inserted into the tubular portion while retaining a certain

degree of play between the base portion of the gunpowder layer and the tubular portion; and the receiving member and the heat shielding ring constituting the heat shielding means are concentrically supported by an open end of the tubular portion. With this, a positional relation between the fuse stick and the highly combustive tube is appropriately maintained, and transferring of the flame from the gunpowder layer to the highly combustive tube is surely carried out without any trouble. Moreover, since the fuse stick is detachable, it is convenient in handling.

[0019] In the above configuration, a receiving portion is disposed on the support base supporting the support rod so as to correspond to a base portion of the flower petal-like piece, a spring is disposed within the receiving portion and between the support base and the support rod to bias the support rod so as to push the support rod in an upward direction, when the support rod is lowered with respect to the support base against the spring, and the flower petal-like pieces are in the closed position, base portions of the flower petal-like pieces are pulled into the receiving portion, in this state, the support base and the open end of the tubular portion of the support rod are coupled to each other by a combustible string, the string is spliced to the gunpowder layer of the fuse stick, and lashing between the support rod and the support base is canceled by burning off the string by combustion heat of the gunpowder layer. With this, in the original state, the flower petal-like pieces are surely held in the closed position. Lashing of the movable portion including the flower petal-like pieces with respect to the support base is canceled immediately after simultaneously lighting the wicks of the candles, and the flower petal-like pieces spread out. Therefore, the flower petal-like pieces do not cause malfunction.

[0020] In the above configuration, the support rod is divided into an upper support rod on which the fuse stick stands and a lower support rod supported by the support base, a cup-like container is disposed between the upper and lower support rods, a melody producing device comprised of a melody producing circuit IC and a speaker is disposed in the cup-like container, used as one of lead wires connecting the melody producing device and a power source is a twist wire formed by twisting two conductive wires which are insulated from each other, at a base end of the twist wire, one of the conductive wires is connected to the melody producing device, and another conductive wire is connected to the power source, a free end portion of the twist wire extends along the upper support rod up to the position where the wicks face each other, and is held by the fuse stick so as to wind the fuse stick, insulation between the two conductive wires is canceled by combustion heat of the gunpowder layer, so that a line-to-line short circuit occurs, and the power source is turned on. With this, simultaneously with the simultaneous lighting of the wicks of the candles, the power source of the melody producing device is tuned on, and music suitable for the site can be played from the speaker. Therefore, this music is synergistically added to the flame of the moving candles and the movement of the flower petal-like pieces, and pleasantly warms up the atmosphere. Moreover, since a switch is not required to turn on the power source, simplification of the configuration and reduction in the production cost can be achieved.

Moreover, a candle apparatus is configured such that: base ends of a plurality of flower petal-like pieces are supported around a support rod such that the flower petal-like pieces are openable and closable in a vertical direction, the support rod having a lower portion supported by a support base such that the support rod is movable upward and downward; candles are attached to tip end portions of the flower petal-like pieces; when the flower petal-like pieces stand and are in a closed position, the candles of the flower petal-like pieces lie down, and wicks of the candles face each other above the support rod and are maintained in this state; this state is canceled by simultaneously lighting the wicks, so that the flower petal-like pieces spread out and stay in an open position; and the lit candles stand in an upright position on the flower petal-like pieces, wherein: a melody producing device formed by a melody producing circuit IC and a speaker is disposed within or below a cup-like container; the melody producing device includes plural sets of lead wires; at least one set of lead wires of the plural sets of lead wires is extended up to the vicinity of the wicks of the candles, and the set of lead wires is arranged such that the melody producing device is energized by short-circuit of the set of lead wires caused by flame of the candles; and at least one set of lead wires of the plural sets of lead wires are extended outside the support base, and the set of lead wires is arranged such that the melody producing device is energized by short-circuit of the set of lead wires. With this, the candle apparatus can be inspected without lighting the candle apparatus.

[0021] In the above configuration, the melody producing device is configured so as to play a melody a predetermined number of times after the melody producing device is energized. With this, it is possible to further warm up the party.

In the above configuration, insulation of the set of lead wires extended outside the support base is canceled by spreading-out of the flower petal-like pieces, so that the melody producing device is energized. With this, even if the insulation of the lead wires in the vicinity of the candle is not canceled by the flame, opening of the flower petal-like pieces cancels the insulation of the lead wires, so that the melody producing device can operate.

Moreover, in the above configuration, at least one of the wicks of the candles is formed so as to be divided into a plurality of wicks. With this, it is possible to easily attach the wick to the attachment tube, and to reduce mistakes in lighting the wicks.

Moreover, in the above configuration, the wicks of the candles share at least one of the wicks of the candles. With this, a plurality of candles can be lit only by transferring the flame to at least one wick.

[0022] Moreover, in the above configuration, at least

one of the wicks of the candles is formed so as to have an annular shape. With this, it is possible to reduce the mistakes in lighting the wicks.

Effects of the Invention

[0023] The present invention is carried out in modes explained above. In accordance with the present invention, the wicks of a plurality of candles are lit by using a fuse stick standing at a center of the apparatus. The fuse stick can be lit securely and surely by using a match, lighter or the like. Then, beautiful fireworks generated on the apparatus by sparks spattering by burning of a gunpowder layer of the fuse stick are enjoyed. After that, the following can be seen in this order: the wicks of the candles lying down are simultaneously lit; the flower petal-like pieces spread out integrally with the candles; the flower petal-like pieces are settled in the open position; and the candles lit on the flower petal-like pieces burn. Therefore, the decoration of the candle apparatus can be further enhanced, and the candle apparatus is amusing and is effective to gorgeously warm up the atmosphere of a site, such as a birthday party.

Best Mode for Carrying Out the Invention

[0024] Hereinafter, a candle apparatus according to an embodiment of the present invention will be specifically explained in reference to the drawings.

[0025] Fig. 1 is a schematic longitudinal sectional view of a candle apparatus according to the present invention in a state in which flower petal-like pieces of the candle apparatus are in the open position. Fig. 2 is an exploded perspective view of important parts. Fig. 3 is a perspective view of the candle apparatus in a state in which the flower petal-like pieces are in the open position. Fig. 4 is a side view of the candle apparatus in a state in which the flower petal-like pieces are in the closed position. Fig. 5 is a plan view of the candle apparatus in a state in which the flower petal-like pieces are in the closed position.

[0026] In the candle apparatus according to the present invention, a gunpowder layer formed around a core of a fuse stick changes its shape because of burning. Therefore, for easier comprehension of the drawings, the shape of the burned gunpowder layer is not shown, but the original shape of the gunpowder layer is shown. Also, a highly combustive tube covering the fuse stick disappears because of burning almost without retaining its original shape. Therefore, for easier comprehension of the drawings, the original shape of the highly combustive tube is shown.

[0027] In the drawings, reference number 1 denotes a support rod. The support rod 1 of Embodiment 1 is comprised of a lower support rod 1a and an upper support rod 1b.

[0028] Base ends 2a of a plurality of flower petal-like pieces 2 are supported around the lower support rod 1a such that the flower petal-like pieces 2 are openable and closable in a vertical direction. To support the flower petal-like pieces 2 by the lower support rod 1a, a disc-shaped support disc 3 having cavities along a peripheral portion thereof is disposed on the lower support rod 1a, and the base ends 2a of the flower petal-like pieces 2 having T-shaped retaining projections are inserted into the cavities through elongate holes 4 formed on a peripheral wall of the support disc 3. Using the base ends 2a as fulcrums, the flower petal-like pieces 2 stand around the support disc 3 in the case of the closed position and project in a radial pattern around the support disc 3 in the case of the open position.

[0029] Candles 5 are attached to tip end portions of the flower petal-like pieces 2. The candle 5 is inserted into and attached to an attachment tube 6 formed on each flower petal-like piece 2. The length of the candle 5 is set such that when the flower petal-like pieces 2 are in the closed position, the candles 5 lie down, and wicks 5a of the candles 5 face each other. Moreover, when the flower petal-like pieces 2 spread out and are in the open position, the candles 5 stand in an upright position on the flower petal-like pieces 2.

[0030] The lower support rod 1a is supported by a support base 7 so as to be movable upward and downward. A dish-like concave receiving portion 8 is formed at an upper portion of the support base 7 so as to correspond to the support disc 3. A spring 9 is disposed in the receiving portion 8 and between the support base 7 and the support disc 3 to bias the lower support rod 1a so as to push it in an upward direction. When the lower support rod 1a is lowered with respect to the support base 7 against the spring 9, and the flower petal-like pieces 2 are in the closed position, base portions of the flower petal-like pieces 2 are pulled into the receiving portion 8 together with the support disc 3.

[0031] The support base 7 is detachably supported by a pedestal 10 having three legs 10a for freestanding. To be specific, a hollow leg 11 which covers the lower support rod 1a such that the lower support rod 1a is movable upward and downward and whose lower end 11a is sharp is disposed below the support base 7, and the hollow leg 11 is detachably inserted into and attached to a support hole 10b formed on the pedestal 10.

[0032] A cup-like container 12 is disposed between the lower support rod 1a and the upper support rod 1b. The cup-like container 12 is formed such that an upper surface of the support disc 3 is a bottom surface of the cup-like container 12, and a peripheral wall of the cup-like container 12 is formed on the support disc 3. The upper support rod 1b is disposed so as to project at a center portion of a lid 12a covering the container 12. The upper support rod 1b of Embodiment 1 is fixed to a support projection formed so as to project at the center portion of the lid 12a.

[0033] A fuse stick 13 obtained by forming a gunpowder layer 14 containing a fireworks generating component around a core 13a is disposed so as to stand on the upper support rod 1b. The core 13a is exposed at a lower

portion of the fuse stick 13. This exposed portion of the core is detachably inserted into and attached to a support hole 15 formed at a center of the upper support rod 1b such that the fuse stick 13 is disposed so as to project on the upper support rod 1b.

[0034] Moreover, a tubular portion 16 is formed so as to extend on the upper support rod 1b. With the support hole 15 positioned in the tubular portion 16, a base portion of the gunpowder layer 14 of the fuse stick 13 is inserted into the tubular portion 16 while retaining a certain degree of play between the base portion of the gunpowder layer 14 and the tubular portion 16. The wicks 5a of the candles 5 are disposed above the upper support rod 1b so as to face each other around the gunpowder layer 14 on the base portion side of the fuse stick 13. In the original state, the wicks 5a of the candles 5 are held so as to face each other.

[0035] The candles 5 may be configured such that the wicks 5a face each other around the gunpowder layer 14 while contacting the gunpowder layer 14.

[0036] Simultaneous lighting of the wicks 5a of the candles 5 in this case is carried out as follows: the gunpowder layer 14 at an upper end of the fuse stick 13 is lit by the flame of a match, lighter or the like; the gunpowder layer 14 starts burning; sparks spattering around the fuse stick 13 become beautiful fireworks; a burning point (origin of fire) of the gunpowder layer 14 approaches to a position where the wicks 5a of the candles 5 face each other; sparks newly generated from the burning point fall on the wicks 5a of the candles 5 lying down around the gunpowder layer 14, so that the wicks 5a are preheated; after the burning point gets close to the position where the wicks 5a face each other, tip end portions of the heated wicks of the candles 5 get in the sparks newly generated at an outer peripheral portion of the burning point; and all the wicks 5a are simultaneously lit.

[0037] To intriguingly producing the simultaneous lighting of the wicks 5a of the candles 5, Embodiment 1 shown in the drawings adopts a configuration of causing the wicks 5a of the candles 5 to face each other around the gunpowder layer 14 without contacting the gunpowder layer 14.

[0038] To be specific, the highly combustive tube 17 covers the fuse stick 13 on an open end of the tubular portion of the upper support rod 1b, a base portion of the highly combustive tube 17 is supported by the open end of the tubular portion at an upper end of the support rod with heat shielding means interposed therebetween, and the wicks 5a of the candles 5 are disposed so as to face each other around the highly combustive tube 17. The heat shielding means of Embodiment 1 is comprised of: a metal receiving member 18 including a tubular body to be inserted into the base portion of the highly combustive tube 17 and a flange formed at a lower end of the tubular body; and a metal heat shielding ring 19 which covers the highly combustive tube 17 on the receiving member 18. To support these, a step portion 18a which is formed on the open end of the tubular portion of the upper support rod 1b and on which the flange of the receiving member 18 is seated and a step portion 19a which is formed above the step portion 18a and on which the heat shielding ring 19 is seated are circumferentially formed in a step-like manner. First, the fuse stick 13 is inserted into the highly combustive tube 17 to which the receiving member 18 is attached while retaining a certain degree of play between the fuse stick 13 and the highly combustive tube 17, the flange of the receiving member 18 is seated on the step portion 18a at the open end of the tubular portion, the heat shielding ring 19 is disposed from above these members and is seated on the step portion 19a at the open end of the tubular portion, the base portion of the highly combustive tube 17 is sandwiched between the heat shielding ring 19 and the receiving member 18 so as to be supported concentrically, and a slight gap is formed between the highly combustive tube 17 and the gunpowder layer 14 over the entire circumference of the gunpowder layer 14.

[0039] The simultaneous lighting of the wicks 5a of the candles 5 in this case is carried out as follows: the gunpowder layer 14 at the upper end of the fuse stick 13 is lit by the flame of a match, lighter or the like; the gunpowder layer 14 starts burning; sparks spattering around the fuse stick 13 become beautiful fireworks; the burning point (origin of fire) of the gunpowder layer 14 reaches the position of the highly combustive tube 17 covering the circumference of the gunpowder layer 14; the highly combustive tube 17 is lit by the sparks spattering around the fuse stick 13; the highly combustive tube 17 generates strong flame and is instantly burned out; the wicks 5a of the candles 5 are subjected to the flame generated at this time; and thus the wicks 5a are simultaneously lit. Moreover, the heat shielding ring 19 is disposed on the upper portion of the tubular portion 16. Therefore, when the flame on the fuse stick 13 gets inside the tubular portion 16 below the heat shielding ring 19, the temperature around the flame becomes high since this space is partially closed. With this, as will be described later, by disposing a lead wire 24 in the tubular portion 16 below the heat shielding ring 19, it is possible to melt an insulating layer of the lead wire 24 by this high heat without using the highly combustive tube 17.

[0040] Moreover, in Embodiment 1 shown in the drawings, to maintain the original state, that is, to maintain a state where the lower support rod 1a is lowered with respect to the support base 7 against the spring 9, and the flower petal-like pieces 2 are held in the closed position, the support base 7 and the open end of the tubular portion of the upper support rod 1b are coupled to each other by a combustible string 20. A lower end of the string 20 is fixed to the support base 7, and an upper end of the string 20 extends up to the position of the open end of the tubular portion of the upper support rod 1b through, for example, a through hole formed at an appropriate position such that the string 20 shortcuts as much as possible toward the upper support rod 1b and does not become an obstruction. Then, the upper end of the string 20 is

fixed to an engagement groove 21 formed in a cutout shape at the open end of the tubular portion, so as to engage with the engagement groove 21. The string 20 is spliced to the gunpowder layer 14 of the fuse stick 13 in the tubular portion 16, and can be burned off by combustion heat of the gunpowder layer 14. The material of the string 20 is generally a combustible material, such as cotton or nylon, but is not limited to this.

[0041] After the string 20 burns out, a movable portion including, for example, the flower petal-like pieces 2 supported by the lower support rod 1a is pushed upward with respect to the support base 7 by the repulsive force of the spring 9, and then the flower petal-like pieces 2 spread out on the receiving portion 8. At this time, on the receiving portion 8, the tip end portions to which the candles 5 are attached move downward attractively as the base portions of the flower petal-like pieces 2 move upward, and the flower petal-like pieces 2 are uniformly supported on the receiving portion 8.

[0042] Moreover, in order that a time that lapses from when the flower petal-like pieces 2 start spreading out until the flower petal-like pieces 2 are settled on the receiving portion 8 may not become too short, an adhesive or the like may be applied to a slide portion of the lower support rod 1a with respect to the support base 7 to adjust the time. Therefore, the flower petal-like pieces 2 becomes attractive in terms of the speed of spreading-out of the flower petal-like pieces 2, and effectively warms up the atmosphere gorgeously.

[0043] Moreover, in Embodiment 1 shown in the drawings, a melody producing device 22 comprised of a melody producing circuit IC and a speaker is disposed within the cup-like container 12. In order to turn on and off a power source 23 of the melody producing device 22, used as one of lead wires 24 connecting the melody producing device 22 and the power source 23 is a twist wire formed by twisting two conductive wires on each of which an insulating layer which easily burns out, is weak against heat and is thin is formed and which are insulated from each other. At a base end of the twist wire, one of the conductive wires is connected to the melody producing device 22, and another conductive wire is connected to the power source 23. A free end portion of the twist wire extends along the upper support rod 1b up to the position of the open end of the tubular portion, and is held by the fuse stick 13 so as to loosely wind the fuse stick 13. The insulating layers of two conductive wires burn out by the combustion heat generated when the gunpowder layer 14 burns, so that a line-to-line short circuit occurs. Thus, the power source 23 is turned on. Moreover, in order to prevent the melody producing device 22 from malfunctioning due to short-circuit caused by peel-off of the insulating layer by friction between the fuse stick 13 and the lead wire 24, the lead wire 24 may be disposed in the vicinity of the engagement groove 21 or inside the tubular portion 16 so as not to contact the fuse stick 13, instead of causing the fuse stick 13 to hold the lead wire 24 winding the fuse stick 13.

[0044] In the drawings, reference numeral 25 denotes a small flower petal-like piece which is located above the flower petal-like pieces 2 and whose base end 25a is supported around the support disc 3 such that the small flower petal-like piece is openable and closable in a vertical direction. The small flower petal-like pieces 25 are disposed to increase gorgeousness. As with the flower petal-like pieces 2, base ends 25a of the small flower petal-like pieces 25 having T-shaped retaining projections are inserted into the cavities formed on the peripheral wall of the support disc 3 so as to be supported by the cavities. The small flower petal-like pieces 25 open and close as the flower petal-like pieces 2 open and close.

[0045] In accordance with the candle apparatus of Embodiment 1 configured as above, first, the candle apparatus is set (stood) on, for example, a cake, and the gunpowder layer 14 at an upper end of the fuse stick 13 is lit by using an at-home match or lighter. The gunpowder layer 14 starts burning, and in a process in which the burning point proceeds toward the base portion of the fuse stick 13, beautiful fireworks created by the sparks spattering around the fuse stick 13 can be seen on the apparatus. Such fireworks warm up the atmosphere of the side as an opening act before the simultaneous lighting of the wicks 5a of a plurality of candles 5.

[0046] When the gunpowder layer 14 keeps burning, and the burning point reaches the position of the highly combustive tube 17, the highly combustive tube 17 generates strong flame and is instantly burned out. Then, the wicks 5a of the candles 5 are subjected to the flame generated at this time. Thus, the wicks 5a are simultaneously lit. The generation of the strong flame observed since the highly combustive tube 17 burns out in a short period of time is surprising and attractive, and intriguingly produces the simultaneous lighting of the wicks 5a of the candles 5.

[0047] Moreover, simultaneously with the lighting of the wicks 5a, the string 20 coupling the support base 7 and the open end of the tubular portion of the upper support rod 1b is burned off. Thus, the flower petal-like pieces 2 start spreading out. The movable portion including, for example, the flower petal-like pieces 2 supported by the lower support rod 1a is pushed upward by the spring 9, and then the flower petal-like pieces 2 spread out on the receiving portion 8. The movement of the flame of the candles 5 occurring when the flower petal-like pieces 2 simultaneously spread out, which is observed at this time, is similar to a dynamic movement that is just like a movement from the lighting of fireworks to the beautiful spreading of the fireworks, and creates an amusing and gorgeous atmosphere.

[0048] Further, simultaneously with the lighting of the wicks 5a, the twist wire formed by two conductive wires held by the fuse stick 13 so as to loosely wind the fuse stick 13 causes the line-to-line short circuit. This turns on the power source 23 of the melody producing device 22, and appropriate music for the place is played from the

speaker. Thus, this music pleasantly warms up the atmosphere of the side of, for example, a birthday party.

[0049] Next, another embodiment will be explained.

[0050] Fig. 6 is a perspective view showing that that an inspection switch is further incorporated into the configuration of Fig. 4. Fig. 7 is a partial cross-sectional view of Fig. 6. Fig. 8 is a diagram showing a state where the flower petal-like pieces of Fig. 7 are open. Fig. 9 is a perspective view showing that the configuration of the inspection switch is changed in the configuration of Fig. 6. Fig. 10 is a partial cross-sectional view of Fig. 9. Fig. 11 is a diagram showing a state where the flower petal-like pieces of Fig. 10 are open.

[0051] As shown in Fig. 6, an inspection switch 28 is disposed on a flower petal-like portion located outside the support base 7. As shown in Fig. 7, a nichrome wire (lead wire) 29 connects the inspection switch 28 with a power source stored in the melody producing device 26 so as to extend along the flower petal-like portion located outside the support base 7. A nichrome wire 24 is disposed so as to connect the melody producing device 26 with the fuse stick 13 and to be electrically in parallel with the nichrome wire 29. With this configuration, only by pressing the inspection switch 28, a function test (confirmation whether voice or music is played or not) of the melody producing device 26 can be carried out without actually lighting, for example, the candles. Since the function of the product can be confirmed before the product is sold or before a customer buys the product, it is possible to suppress the distribution of defective products after the products are sold or bought. Moreover, a mascot 70 may be disposed on the lid 12a in the candle apparatus. As shown in Figs. 9 and 10, an inspection switch 31 of another embodiment projects outward, and an insulator 33 is inserted in the vicinity of a center of the inspection switch 31. A positive pole and negative pole of the inspection switch 31 are exposed in the vicinity of an outside. In inspection, the function confirmation is carried out by bringing a current-carrying tool 32 prepared in advance into contact with this exposed portion. As shown in Fig. 11, other than the inspection, the string 20 supporting the flower petal-like pieces is burned off by the flame of the candles, and the inspection switch 31 moves upward in association with the opening movement of the flower petal-like pieces. Thus, the inspection switch 31 is energized. With this, even when the insulation of the nichrome wire 24 in the vicinity of the candles is not canceled, the voice or music is output from a melody producing device 30 simultaneously with the opening movement of the flower petal-like pieces to which the lit candles are attached. Thus, it is possible to warm up the party.

[0052] Figs. 12 are diagrams of the candle apparatus. Fig. 12(a) is a diagram when viewed from above, and Fig. 12(b) is a diagram of a linked candle used in Fig. 12 (a).

[0053] When a linked candles 34 in which waxes 34a share one wick 34b and are attached to both ends of the wick 34b as shown in Fig. 12(b) is attached to the attachment tubes 6 as shown in Fig. 12(a), it is diagonally attached to the attachment tubes 6 based on the fuse stick 13 as a central axis. This is performed for a plurality of linked candles 34. The linked candles attached to the attachment tubes 6 are disposed such that each wick 34b contacts the fuse stick 13. Therefore, when the flame of the lit fuse stick 13 reaches a portion where the flame contacts the wicks 34b, the flame can be efficiently transferred to the wicks 34b.

[0054] Figs. 13 are diagrams of the candle apparatus. Fig. 13(a) is a diagram when viewed from above, and Fig. 13(b) is a diagram of an annular wick candle used in Fig. 13(a).

[0055] As shown in Fig. 13(b), an annular wick candle 36 in which a wick 36b has an annular shape is configured such that the wick 36b is formed to have an annular shape, and then a tip end of the wick 36b is inserted in a wax 36a so as to be fixed. As shown in Fig. 13(a), the fuse stick 13 passes through annular portions of the wicks 36b of the annular wick candles 36, and the annular wick candles 36 are radially disposed around the fuse stick 13. Since the wick 36b has an annular shape, the flower petal-like pieces to which the annular wick candles 36 are attached cannot open if the flame of the fuse stick 13 is not transferred to the wicks 36b immediately. Therefore, the wicks keep contacting the fuse stick 13 until the flame is completely transferred to the wicks. Thus, it is possible to reduce mistakes in lighting the candles.

[0056] Figs. 14 are diagrams of the candle apparatus. Fig. 14(a) is a diagram when viewed from above, and Fig. 14(b) is a diagram of an elongate wick candle used in Fig. 14(a).

[0057] As shown in Fig. 14(b), an elongate wick candle 38 in which a wick 38b is attached to a wax 38a, and the wick 38b is long is formed such that the wick is extremely longer than the wick of a general candle. As shown in Fig. 14(a), at least one elongate wick candle 38 is attached to the attachment tube 6, is configured such that the wick of the elongate wick candle 38 contacts the other wicks of the candles attached to the attachment tubes 6, and is disposed such that the wick 38b surrounds the fuse stick 13. With this configuration, it is possible to easily dispose the candles and to reduce the mistakes in the lighting.

[0058] Figs. 15 are diagrams of the candle apparatus. Fig. 15(a) is a diagram when viewed from above, Fig. 15 (b) is a V-shaped wick candle used in Fig. 15(a), and Fig. 15(c) is a diagram of a plural-wick candle in which the wick of the candle of Fig. 15(b) is comprised of a plurality of wicks.

[0059] As shown in Fig. 15(b), a V-shaped wick candle 40 in which two wicks 40b are attached to a wax 40a, and the wicks 40b form a V shape is attached to the attachment tube 6. As shown in Fig. 15(a), the wicks 40b are disposed so as to sandwich the fuse stick 13. With this configuration, the flame is easily transferred to the wicks when transferring the flame of the fuse stick 13 to

the candles, and it is possible to reduce the mistakes in lighting the candles. As shown in Fig. 15(c), by using a plural-wick candle 41 in which a plurality of wicks 41b are attached to a wax 41a, the flame may be further easily transferred to the wicks.

[0060] Figs. 16 are diagrams schematically showing how to bundle the candles when the fuse stick is not disposed. Fig. 16(a) is a diagram showing a state where the candles are not yet bundled, Fig. 16(b) is a diagram showing a state where the wicks are twisted after the state of Fig. 16(a), and Fig. 16(c) is a diagram showing a state where the wicks are assembled and fixed by, for example, wax after the state of Fig. 16(a).

[0061] As shown in Fig. 16(a), in the case of forming a lighting portion only by the candles without using the fuse stick 13, the wicks of the candles need to be long and be bundled. In the case of bundling three candles attached to the attachment tubes 6, first, there are a method for collecting tip end portions of the wicks and twisting the tip end portions of the wicks as shown in Fig. 16(b) and a method for fixing the collected tip end portion by, for example, a wax 37 as shown in Fig. 16(c). In the twisting method shown in Fig. 16(b), since three wicks are just twisted by hands, this method does not require any special tools. However, the twisting operation is troublesome. In contrast, in the method for fixing the tip end portion by the wax as shown in Fig. 16(c), although this method does not require the twisting operation, it requires, for example, a tool for fixing the wax at a predetermined position. Therefore, this method requires equipment cost.

[0062] Fig. 17 is a diagram showing a state where the candles of Fig. 16 are attached to the attachment tubes, and the flower petal-like pieces are closed, and is a cross-sectional view of the candle apparatus supported by one upper support rod.

[0063] As shown in Fig. 17, wicks 39 of a plurality of candles are bundled at substantially a center of the candle apparatus in a state in which the flower petal-like pieces 2 are closed, and the bundled wicks 39 of the candles contact an upper end portion 80a of an upper support rod 80. A hole or a cutout is formed in the vicinity of the upper end portion 80a of the upper support rod 80 such that the string 20 can be put thereon. The string 20 is coupled to the support base 7 such that the flower petal-like pieces 2 do not open. The string 20 put on the upper support rod 80 is attached so as to contact the wicks 39 of the candles. Therefore, while the wicks 39 of the candles are lit, and the flame is transferred from the upper ends of the wicks to the wax, the flame is transferred to the string 20, the string 20 is thereafter burned off, and the flower petal-like pieces 2 open.

[0064] Fig. 18 is a cross-sectional view of the candle apparatus in which two upper support rods each similar to the upper support rod of Fig. 17 are used.

[0065] As shown in Fig. 18, two upper support rods 81 are formed in the vicinity of substantially a central axis of the candle apparatus. The string 20 for coupling the upper support rods 81 to the support base 7 is put on two upper support rods 81 so as to contact the bundled wicks 39. With this, when the flame lit at the upper ends of the wicks 39 and transferred reaches the string 20, a range where the string 20 and the flame contact becomes large. Therefore, as compared with the string 20 put on one upper support rod 80 of Fig. 17, it is possible to easily burn off the string 20 and to quickly open the flower petal-like pieces 2. Thus, the party can proceed smoothly and be warmed up.

[0066] Figs. 19 are front views of three different types of upper support rods. Fig. 19(a) shows the upper support rod in which a hole is formed at a portion where the string is put, Fig. 19(b) shows the upper support rod in which the portion where the string is put is cut out in the shape of substantially a semicircle, and Fig. 19(c) shows the upper support rod in which the portion where the string is put is cut out in the shape of substantially a rectangle.

[0067] As shown in Fig. 19(a), in the case of forming a hole 82a at an upper end portion of the upper support rod 82, it is troublesome to put the string 20 through the hole 82a. However, since the string 20 does not come off from an upper side, lower side, left side or right side of the hole 82a, it is possible to prevent the flower petal-like pieces 2 from opening against expectations (see Fig. 17). As shown in Fig. 19(b), in the case of cutting out the upper end portion of the upper support rod 83 in a substantially semicircular shape 83a, the string 20 can be easily put on the substantially semicircular shape 83a. However, the string may come off from the upper side of the substantially semicircular shape 83a to open the flower petal-like pieces 2 against intentions (see Fig. 17). As shown in Fig. 19(c), in the case of cutting out the upper end portion of the upper support rod 84 in a rectangular shape 84a, the string 20 can be easily put on the rectangular shape 84a. However, compared to Fig. 19(b), since the upper end portion is cut out in substantially the rectangular shape 84a in Fig. 19(c), it is possible to suppress that the string slides on the cutout portion so as to come off from the upper side of the rectangular shape 84a.

[0068] Figs. 20-1 are diagrams showing how the candle is attached to the flower petal-like piece. Fig. 20-1(a) is an exploded view, and Fig. 20-1(b) is a partial cross-sectional view showing a state where the candle has been attached to the flower petal-like piece. Figs. 20-2 are enlarged views of another attachment tube. Fig. 20-2 (a) is a plan view, and Fig. 20-2(b) is a partial cross-sectional view when viewed from a side surface.

[0069] As shown in Fig. 20-1(a), in order to attach the candle to the flower petal-like piece 2, a clip 86 including a tubular flange portion 86a to be directly attached to the flower petal-like piece 2 and a fire extinguishing agent 85 to be inserted into the clip 86 are required. Since the clip 86 includes the flange portion 86a, it can be attached to a predetermined position of the attachment tube 6. As shown in Fig. 20-1(b), a procedure of attaching these members to the flower petal-like piece 2 is to insert the clip 86 for fixing the candle into the attachment tube 6

such that the flange portion 86a contacts the attachment tube 6, to put the tubular fire extinguishing agent 85 in the clip 86, and to insert the candle into the tubular fire extinguishing agent 85. With this, when the flame is transferred and reaches the vicinity of the attachment tube 6, the flame does not proceed any more because of the fire extinguishing agent 85 inserted in the attachment tube 6.

[0070] Figs. 20-2 are views of another attachment tube. Fig. 20-2(a) is a plan view, and Fig. 20-2(b) is a partial cross-sectional view when viewed from a side surface.

[0071] As shown in Figs. 20-2, an attachment tube 87 has a substantially cylindrical shape, and equally-spaced projections 88 are formed on an inner wall of the attachment tube. Moreover, an inclined portion 89 is formed on a side of the attachment tube 87 on which the candle 5 is inserted, so that the candle 5 is easily inserted into the attachment tube 87. A curved portion 91 is formed on a side of each projection 88 which is close to a central axis of the attachment tube 87. The curved portions 91 stick in the wax of the candle 5 so as to fix the candle 5. Moreover, a fire extinguishing agent 90 is filled between the equally-spaced projections 88. The fire extinguishing agent 90 is filled on a central axis side of the attachment tube 87 so as not to be higher than the projection 88, and the fire extinguishing agent 90 is filled between the candle 5 and the projections 88. Thus, it is possible to prevent the candle 5 from falling off from the attachment tube 87 due to slipping of the candle.

[0072] Figs. 21 are diagrams showing a state where one flower petal-like piece is closed. Fig. 21(a) is a front view, Fig. 21(b) is a rear view, and Fig. 21(c) is a partial cross-sectional view when viewed from a side surface.

[0073] As shown in Figs. 21(a), 21(b) and 21(c), the flower petal-like piece 2 has a rice scoop shape. As shown in Fig. 21(b), the attachment tube 6 is attached in the vicinity of a center portion of the flower petal-like piece, and a stopper 42 for preventing the wax from dripping down is attached on a lower side of the attachment tube 6. The stopper 42 has a substantially semi-tubular shape. When the candle burns and melts, the stopper 42 can prevent the wax of the candle from flowing on the flower petal-like piece 2 and dripping off on a table, a cake or the like.

[0074] Figs. 22 are schematic diagrams showing a circuit of the melody producing device. Fig. 22(a) is a diagram showing a front side, and Fig. 22(b) is a diagram showing a rear side. Fig. 23 is a schematic diagram showing a state where a substrate is inserted into a base portion.

[0075] As shown in Figs. 22, a circuit of the melody producing device is configured such that a battery 43, an IC chip 44, a condenser 46, a diode 45 and nichrome wires 49 and 50 are disposed on a front side of a substrate 48, and a speaker 47 is disposed on a rear side of the substrate 48. The nichrome wires 49 and 50 are a combustion switch nichrome wire 49 and an inspection switch nichrome wire 50, and are attached to the substrate so as to be in parallel with each other. The IC chip 44 is electrically connected to the battery 43, the condenser 46, the diode 45, the speaker 47 and the nichrome wires 49 and 50. With this circuit, when the combustion switch nichrome wire 49 or the inspection switch nichrome wire 50 short-circuits, the voice is played from the speaker 47. The circuit is set such that after the voice is played a predetermined number of times, it automatically stops. Therefore, at a party in a dark room, it is unnecessary to turn off the switch, and it is possible to warm up the atmosphere continuously. As shown in Fig. 23, the substrate 48 has a substantially upside-down trapezoid shape. To store the substrate 48 in the cup-like container 12, ribs 53, 54 and 55 of the cup-like container 12 are disposed so as to project at positions corresponding to a right end, a left end and a lower end of the substrate 48. The ribs 53, 54 and 55 are disposed to extend in a vertical direction, and are provided with grooves 53a, 54a and 55a facing the substrate 48. The substrate 48 is inserted into the cup-like container 12 from a vertically upper side along the grooves 53a and 54a, and is fitted in the groove 55a. Thereby, the substrate 48 is fixed to the cup-like container 12. Moreover, inclined portions 48a and 48b are formed on both lower ends of the substrate 28 such that the substrate 28 does not interfere with the cup-like container 12 when attached to the cup-like container 12.

[0076] Fig. 24 is an exploded view of the candle apparatus.

[0077] As shown in Fig. 24, the candle apparatus includes a portion having the hollow leg 11, the pedestal 10 and a fixed plate 92. The hollow leg 11 of the candle apparatus is inserted into the pedestal, and in this state, the legs 10a are inserted into and fixed to attachment holes 92a of the fixed plate 92. By providing the fixed plate 92, it is possible to increase the stability of the candle apparatus when the flower petal-like pieces 2 are open.

[0078] Figs. 25 are diagrams showing an annular substrate having the circuit of the melody producing device of a still another embodiment.

[0079] As shown in Fig. 25, an annular substrate 60 is formed so as to have an opening 60a at a center portion thereof, the annular substrate 60 has substantially semicircular cutouts 63 and 64 which are located so as to sandwich a center O, and holes 65 and 66 are formed in the vicinity of substantially a center portion in a radial direction of the annular substrate 60. Moreover, projecting portions 67 and 68 extending from a lower portion to an upper portion of the candle apparatus are formed on the support base 7, and projections 69 and 70 are formed below the support base 7. A method for attaching the annular substrate 60 to the support base 7 is to first cause the support base 7 to pass through the opening 60a of the annular substrate 60, and then to cause the projecting portion 67 and 68 to fit in the cutouts 63 and 64 and cause the projections 69 and 70 to fit in the holes 65 and 66. Thus, the annular substrate 60 is attached to the support

base 7. The projections 69 and 70 are formed so as to be able to fit in the holes 65 and 66. With this, the annular substrate 60 can be easily detachably attached to the support base 7, and the battery, etc. attached to the annular substrate 60 can be easily changed.

[0080] Fig. 26 is a partial cross-sectional view showing a state where a pedestal of the candle apparatus having the annular substrate is not yet assembled. Fig. 27 is a partial cross-sectional view showing a state where the pedestal of the candle apparatus having the annular substrate has been assembled.

[0081] As shown in Fig. 26, in a state where the annular substrate 60 is attached to the support base 7, the pedestal 93 is inserted from a lower side of the candle apparatus, and fits in and is fixed to the support base 7. The support base 7 has a cylindrical fitting portion 7a. Moreover, the pedestal 93 has a pan-like substrate storing portion 93a which stores the annular substrate 60. The substrate storing portion 93a has a diameter slightly larger than the diameter of the fitting portion 7a so that the substrate storing portion 93a externally fits the fitting portion 7a. As shown in Fig. 27, in the candle apparatus to which the annular substrate 60 and the pedestal 93 are attached, since the annular substrate 60 is stored in the candle apparatus by the pedestal 93 and the support base 7, the annular substrate 60 is not easily detached from the candle apparatus. Meanwhile, at the time of maintenance, such as changing of the battery, the pedestal 93 is just detached toward a lower side of the candle apparatus. Therefore, it can be detached easily.

Industrial Applicability

[0082] Since simultaneously lighting of wicks of a plurality of movable candles constituting a candle apparatus is securely and surely carried out by lighting a fuse stick standing on the apparatus by using an at-home match, lighter or the like, the fuse stick itself generates fireworks on the apparatus, and the fireworks can be enjoyed as an opening act, the present invention can be readily used in various scenes to gorgeously warm up the atmosphere of a site, such as an at-home birthday party, a place for the wedding, etc. Moreover, even in the case of not using the fuse stick, mistakes in lighting the candles can be reduced by devising how to bundle the wicks, and even without the fireworks, the candle apparatus can be used at a birthday party, a place for the wedding, etc. to enjoy the simultaneous lighting of the candles.

Brief Description of the Drawings

[0083]

[Fig. 1] Fig. 1 is a schematic longitudinal sectional view of a candle apparatus according to the present invention in a state in which flower petal-like pieces of the candle apparatus are in an open position.

[Fig. 2] Fig. 2 is an exploded perspective view of important parts of the candle apparatus according to the present invention.

[Fig. 3] Fig. 3 is a perspective view of the candle apparatus in a state in which the flower petal-like pieces are in the open position.

[Fig. 4] Fig. 4 is a side view of the candle apparatus in a state in which the flower petal-like pieces are in a closed position.

[Fig. 5] Fig. 5 is a plan view of the candle apparatus in a state in which the flower petal-like pieces are in the closed position.

[Fig. 6] Fig. 6 is a perspective view showing that an inspection switch is further incorporated into the configuration of Fig. 4.

[Fig. 7] Fig. 7 is a cross-sectional view of Fig. 6.

[Fig. 8] Fig. 8 is a cross-sectional view showing a state where the flower petal-like pieces of Fig. 7 are open.

[Fig. 9] Fig. 9 is a perspective view showing that the configuration of the inspection switch is changed in the configuration of Fig. 6.

[Fig. 10] Fig. 10 is a cross-sectional view of Fig. 9.

[Fig. 11] Fig. 11 is a cross-sectional view showing a state where the flower petal-like pieces of Fig. 10 are open.

[Figs. 12] Figs. 12 are diagrams of the candle apparatus. Fig. 12(a) is a diagram when viewed from above, and Fig. 12(b) is a diagram of a linked candle used in Fig. 12(a).

[Figs. 13] Figs. 13 are diagrams of the candle apparatus. Fig. 13(a) is a diagram when viewed from above, and Fig. 13(b) is a diagram of an annular wick candle used in Fig. 13(a).

[Figs. 14] Figs. 14 are diagrams of the candle apparatus. Fig. 14(a) is a diagram when viewed from above, and Fig. 14(b) is a diagram of an elongate wick candle used in Fig. 14(a).

[Figs. 15] Figs. 15 are diagrams of the candle apparatus. Fig. 15(a) is a diagram when viewed from above, Fig. 15(b) is a V-shaped wick candle used in Fig. 15(a), and Fig. 15(c) is a diagram of a plural-wick candle in which the wick of the candle of Fig. 15(b) is comprised of a plurality of wicks.

[Figs. 16] Figs. 16 are diagrams schematically showing how to bundle the candles when the fuse stick is not disposed. Fig. 16(a) is a diagram showing a state where the candles are not yet bundled, Fig. 16(b) is a diagram showing a state where the wicks are twisted after the state of Fig. 16(a), and Fig. 16(c) is a diagram showing a state where the wicks are assembled and fixed by, for example, wax after the state of Fig. 16(a).

[Fig. 17] Fig. 17 is a diagram showing a state where the candles of Fig. 16 are attached to the candle apparatus, and the flower petal-like pieces are closed, and is a cross-sectional view of the candle apparatus supported by one upper support rod.

[Fig. 18] Fig. 18 is a cross-sectional view of the can-

dle apparatus in which two upper support rods each similar to the upper support rod of Fig. 17 are used.

[Figs. 19] Figs. 19 are front views of three different types of upper support rods. Fig. 19(a) shows the upper support rod in which a hole is formed at a portion where a string is put, Fig. 19(b) shows the upper support rod in which the portion where the string is put is cut out in the shape of substantially a semicircle, and Fig. 19(c) shows the upper support rod in which the portion where the string is put is cut out in the shape of substantially a rectangle.

[Figs. 20-1] Figs. 20-1 are diagrams showing how the candle is attached to the flower petal-like piece. Fig. 20-1(a) is an exploded view, and Fig. 20-1(b) is a partial cross-sectional view showing a state where the candle has been attached to the flower petal-like piece.

[Figs. 20-2] Figs. 20-2 are enlarged views of another attachment tube. Fig. 20-2(a) is a plan view, and Fig. 20-2(b) is a partial cross-sectional view when viewed from a side surface.

[Figs. 21] Figs. 21 are diagrams showing a state where one flower petal-like piece is closed. Fig. 21 (a) is a front view, Fig. 21(b) is a rear view, and Fig. 21(c) is a partial cross-sectional view when viewed from a side surface.

[Figs. 22] Figs. 22 are schematic diagrams showing a circuit of a melody producing device. Fig. 23 is a schematic diagram showing a state where a substrate is inserted into a base portion.

[Fig. 23] Fig. 23 is a schematic diagram showing a state where a substrate is inserted into a base portion.

[Fig. 24] Fig. 24 is an exploded view of the candle apparatus.

[Figs. 25] Figs. 25 are diagrams showing an annular substrate having the circuit of the melody producing device.

[Fig. 26] Fig. 26 is a partial cross-sectional view showing a state where a pedestal of the candle apparatus having the annular substrate is not yet assembled.

[Fig. 27] Fig. 27 is a partial cross-sectional view showing a state where the pedestal of the candle apparatus having the annular substrate has been assembled.

Explanation of Reference Numbers

[0084]

1	support rod
1a	lower support rod
1b	upper support rod
2	flower petal-like piece
2a	base end of flower petal-like piece
3	support disc
4	elongate hole
5	candle
5a	wick
6	attachment tube
7	support base
8	receiving portion
9	spring
10, 93	pedestal
10a	leg
10b	support hole
11	hollow leg
11a	lower end of hollow leg
12	cup-like container
12a	lid
13	fuse stick
13a	core
14	gunpowder layer
15	support hole
16	tubular portion
17	highly combustive tube
18	receiving member
18a	step portion
19	heat shielding ring
19a	step portion
20	string
21	engagement groove
22, 26, 30	melody producing device
23	power source
24	lead wire
25	flower petal-like piece (small type)
25a	base end of flower petal-like piece
28, 31	inspection switch
33	insulator
34	linked candle
36	annular wick candle
38	elongate wick candle
40	V-shaped wick candle
42	stopper
70	mascot
60	annular substrate
92	fixed plate

Claims

1. A candle apparatus in which: base ends of a plurality of flower petal-like pieces are supported around a support rod such that the flower petal-like pieces are openable and closable in a vertical direction, the support rod having a lower portion supported by a support base such that the support rod is movable upward and downward; candles are attached to tip end portions of the flower petal-like pieces; when the flower petal-like pieces stand and are in a closed position, the candles of the flower petal-like pieces lie down, and wicks of the candles face each other above the support rod and are maintained in this state; this state is canceled by simultaneously lighting the wicks, so that the flower petal-like pieces

spread out and stay in an open position; and the lit candles stand in an upright position on the flower petal-like pieces, wherein:

a fuse stick obtained by forming a gunpowder layer containing a fireworks component around a core is disposed so as to stand on the support rod; and
the wicks of the candles are disposed so as to face each other around a portion of the gunpowder layer which is close to a base portion of the fuse stick.

2. The candle apparatus according to claim 1, wherein:

a highly combustive tube covers the fuse stick while retaining a certain degree of play between the highly combustive tube and the fuse stick, so as to correspond to a position where the wicks of the candles face each other; and
a base portion of the highly combustive tube is supported by an upper end of the support rod via heat shielding means.

3. The candle apparatus according to claim 2, wherein the heat shielding means includes a receiving member having a tubular portion to be inserted into the base portion of the highly combustive tube and a flange formed at a lower end of the tubular portion, and a heat shielding ring which covers the highly combustive tube on the receiving member.

4. The candle apparatus according to any one of claims 1 to 3, wherein:

the core is exposed at a lower portion of the fuse stick;
this exposed portion of the core is detachably inserted into a support hole formed at a center of the support rod such that the fuse stick is supported by the support rod;
a tubular portion is formed so as to extend on the support rod;
with a support hole positioned in the tubular portion, a base portion of the gunpowder layer is inserted into the tubular portion while retaining a certain degree of play between the base portion of the gunpowder layer and the tubular portion; and
the receiving member and the heat shielding ring constituting the heat shielding means are concentrically supported by an open end of the tubular portion.

5. The candle apparatus according to any one of claims 1 to 4, wherein:

a receiving portion is disposed on the support base supporting the support rod so as to correspond to a base portion of the flower petal-like piece;
a spring is disposed within the receiving portion and between the support base and the support rod to bias the support rod so as to push the support rod in an upward direction;
when the support rod is lowered with respect to the support base against the spring, and the flower petal-like pieces are in the closed position, base portions of the flower petal-like pieces are pulled into the receiving portion;
in this state, the support base and the open end of the tubular portion of the support rod are coupled to each other by a combustible string;
the string is spliced to the gunpowder layer of the fuse stick; and
lashing between the support rod and the support base is canceled by burning off the string by combustion heat of the gunpowder layer.

6. The candle apparatus according to any one of claims 1 to 5, wherein:

the support rod is divided into an upper support rod on which the fuse stick stands and a lower support rod supported by the support base;
a cup-like container is disposed between the upper and lower support rods;
a melody producing device comprised of a melody producing circuit IC and a speaker is disposed within the cup-like container;
used as one of lead wires connecting the melody producing device and a power source is a twist wire formed by twisting two conductive wires which are insulated from each other;
at a base end of the twist wire, one of the conductive wires is connected to the melody producing device, and another conductive wire is connected to the power source;
a free end portion of the twist wire extends along the upper support rod up to the position where the wicks face each other, and is held by the fuse stick so as to wind the fuse stick;
insulation between the two conductive wires is canceled by combustion heat of the gunpowder layer, so that a line-to-line short circuit occurs; and
the power source is turned on.

7. A candle apparatus in which: base ends of a plurality of flower petal-like pieces are supported around a support rod such that the flower petal-like pieces are openable and closable in a vertical direction, the support rod having a lower portion supported by a support base such that the support rod is movable upward and downward; candles are attached to tip end portions of the flower petal-like pieces; when the

flower petal-like pieces stand and are in a closed position, the candles of the flower petal-like pieces lie down, and wicks of the candles face each other above the support rod and are maintained in this state; this state is canceled by simultaneously lighting the wicks, so that the flower petal-like pieces spread out and stay in an open position; and the lit candles stand in an upright position on the flower petal-like pieces, wherein:

a melody producing device formed by a melody producing circuit IC and a speaker is disposed in or below a cup-like container;
the melody producing device includes plural sets of lead wires;
at least one set of lead wires of the plural sets of lead wires is extended up to the vicinity of the wicks of the candles, and the set of lead wires is arranged such that the melody producing device is energized by short-circuit of the set of lead wires caused by flame of the candles; and
at least one set of lead wires of the plural sets of lead wires are extended outside the support base, and the set of lead wires is arranged such that the melody producing device is energized by short-circuit of the set of lead wires.

8. The candle apparatus according to claim 7, wherein the melody producing device is configured so as to play a melody a predetermined number of times after the melody producing device is energized.

9. The candle apparatus according to claim 7 or 8, wherein insulation of the set of lead wires extended outside the support base is canceled by spreading-out of the flower petal-like pieces, so that the melody producing device is energized.

10. The candle apparatus according to any one of claims 1 to 9, wherein at least one of the wicks of the candles is formed so as to be divided into a plurality of wicks.

11. The candle apparatus according to any one of claims 1 to 10, wherein the wicks of the candles share at least one of the wicks of the candles.

12. The candle apparatus according to any one of claims 1 to 11, wherein at least one of the wicks of the candles is formed so as to have an annular shape.

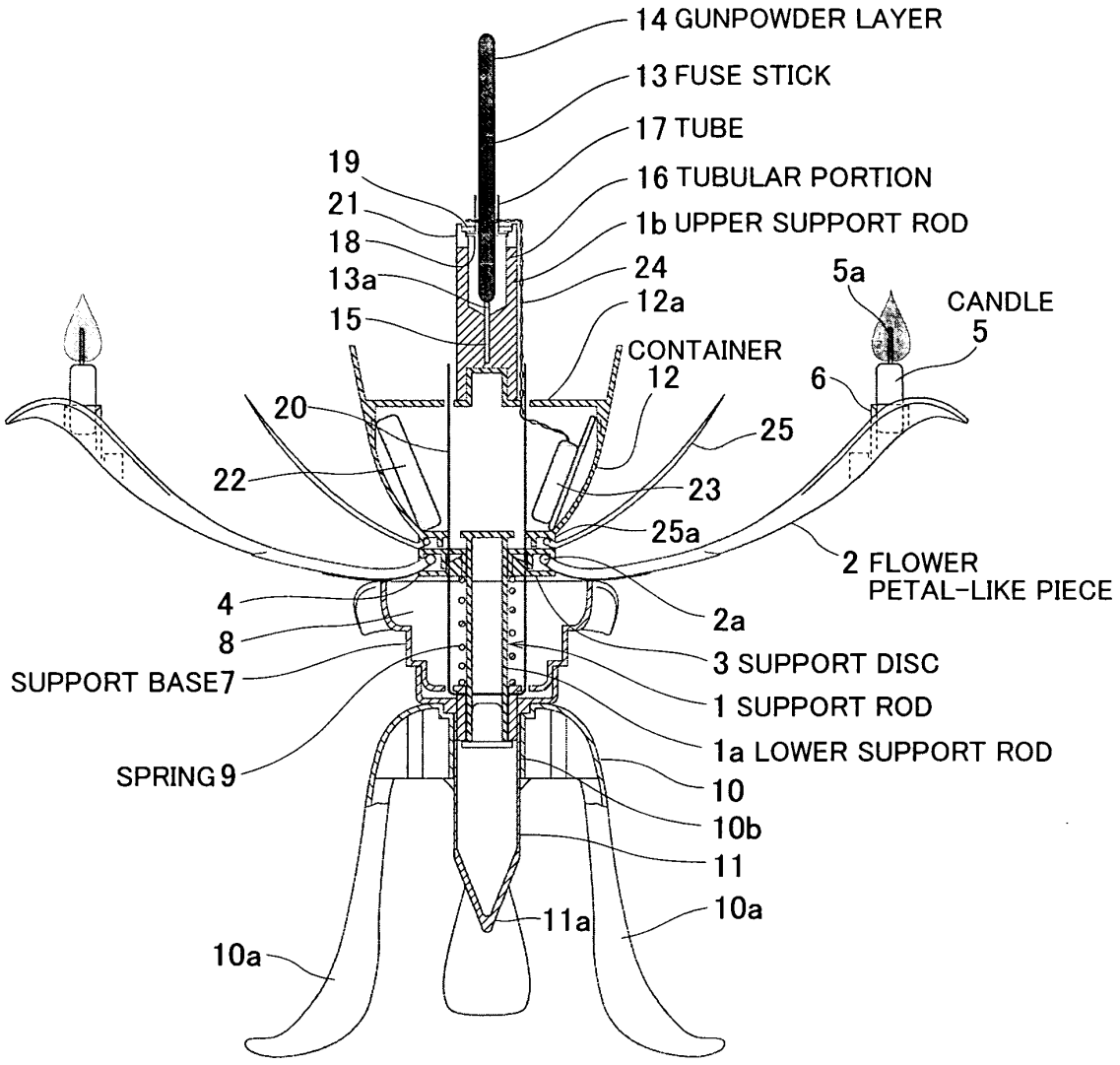

14 GUNPOWDER LAYER
13 FUSE STICK
17 TUBE
16 TUBULAR PORTION
1b UPPER SUPPORT ROD
24
12a
CONTAINER
12
25
23
25a
2 FLOWER PETAL-LIKE PIECE
2a
3 SUPPORT DISC
1 SUPPORT ROD
1a LOWER SUPPORT ROD
10
10b
11
10a
11a
10a
SPRING 9
SUPPORT BASE 7
8
4
22
20
15
13a
18
21
19
5a
CANDLE
5
6

Fig. 1

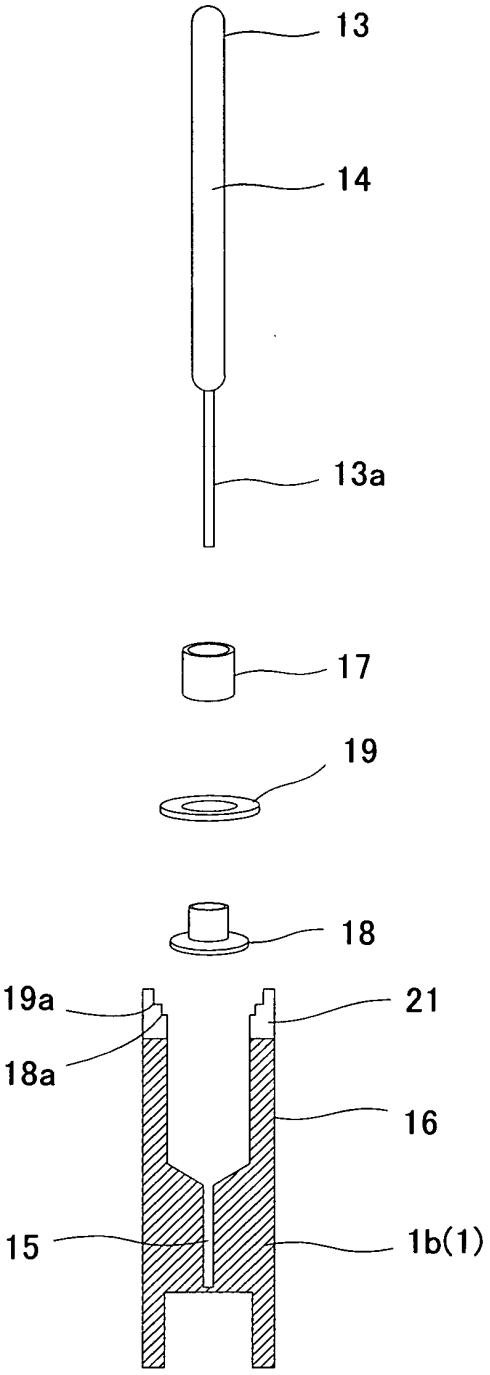


Fig. 2

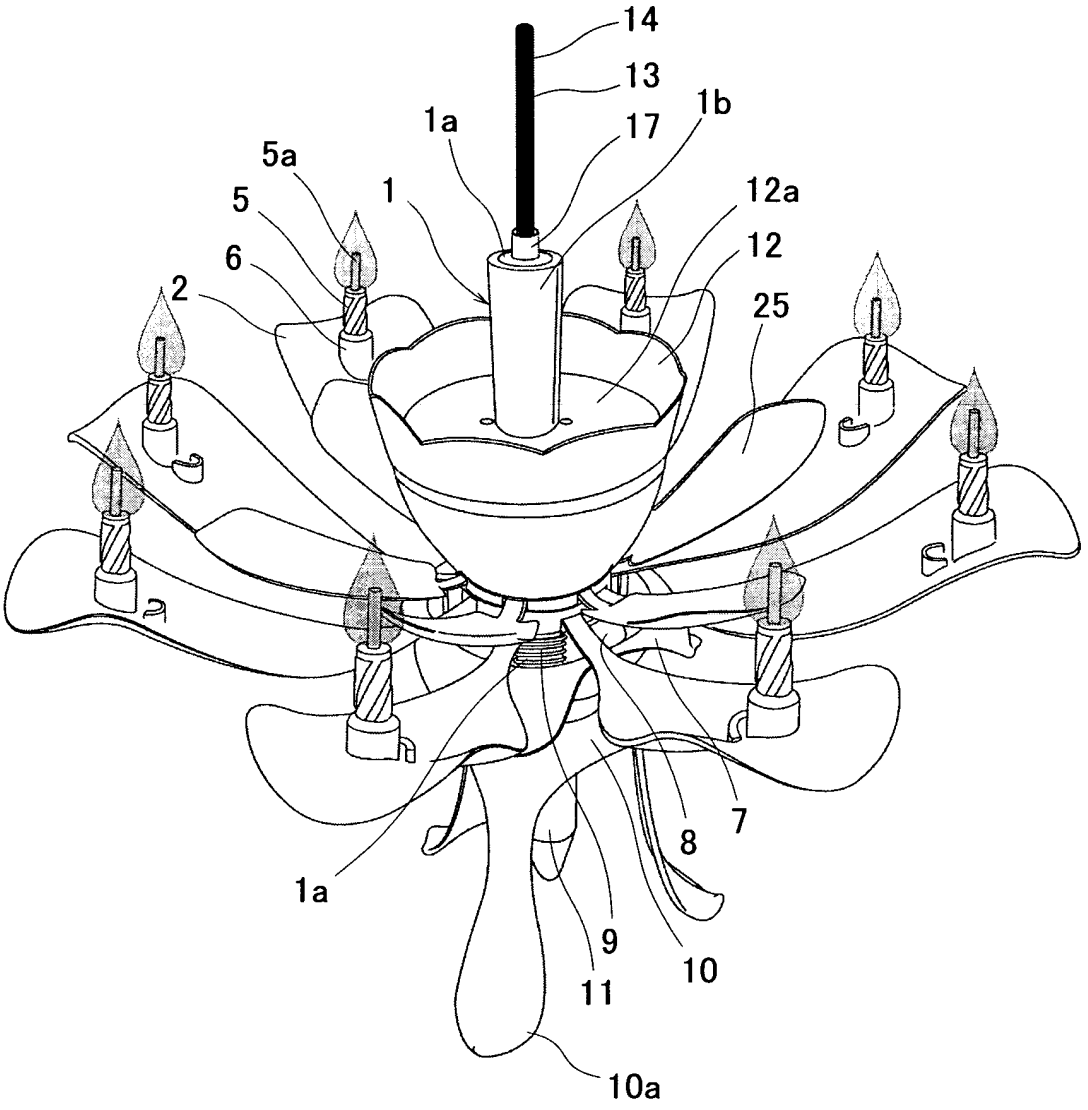


Fig. 3

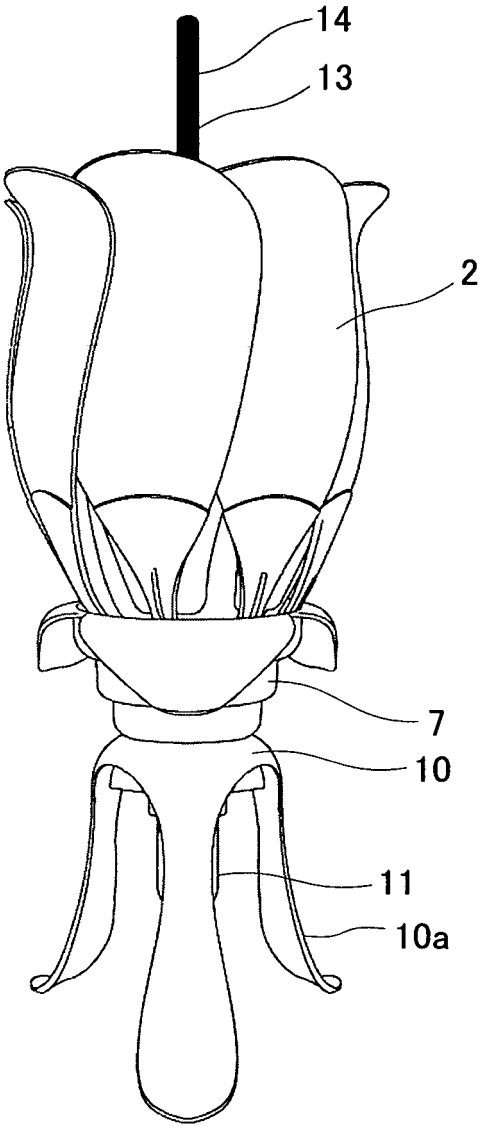


Fig. 4

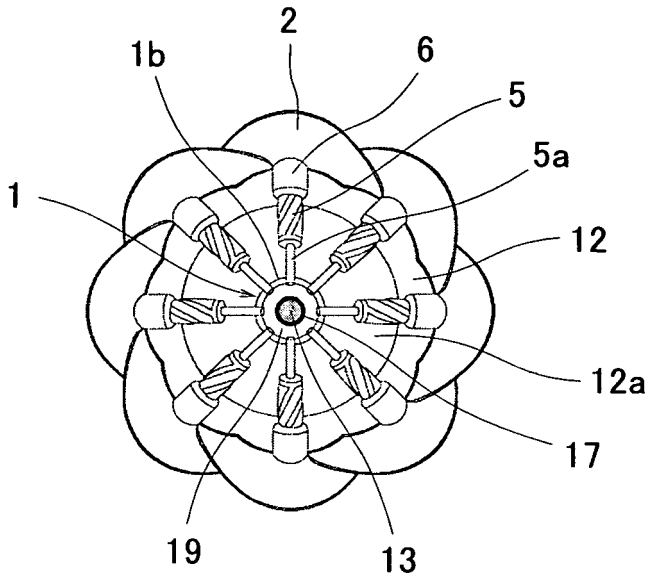


Fig. 5

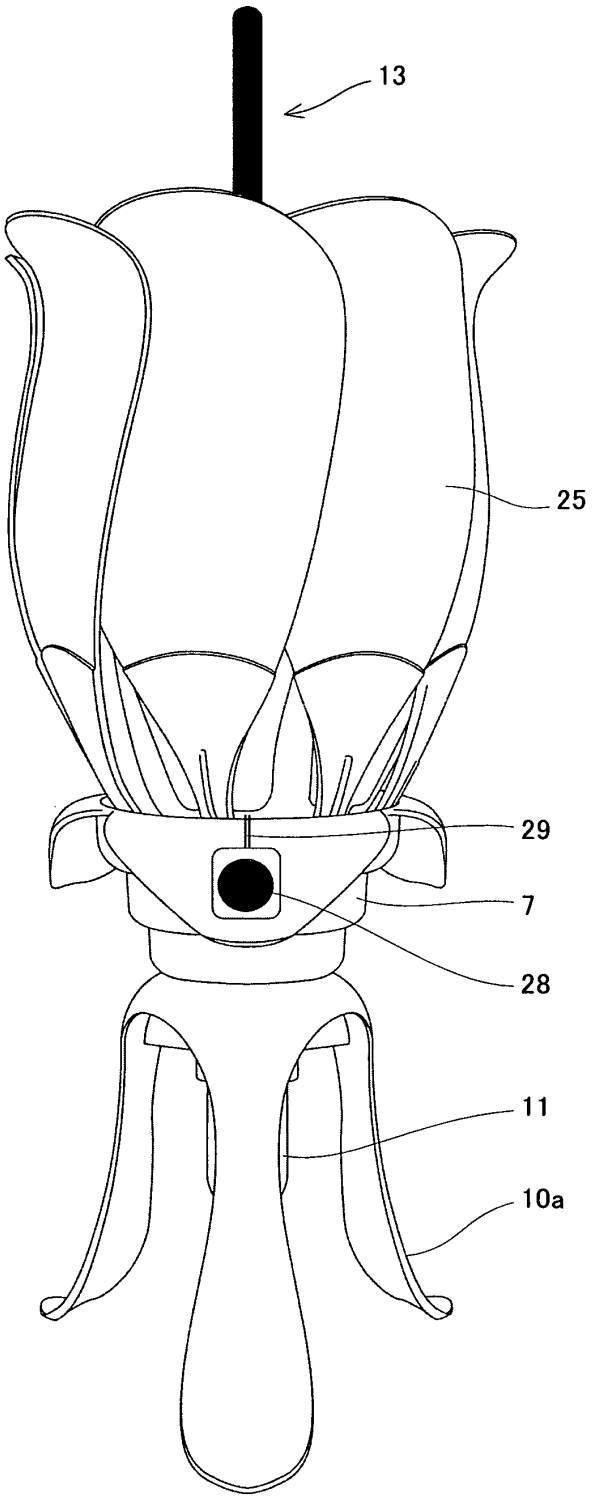


Fig. 6

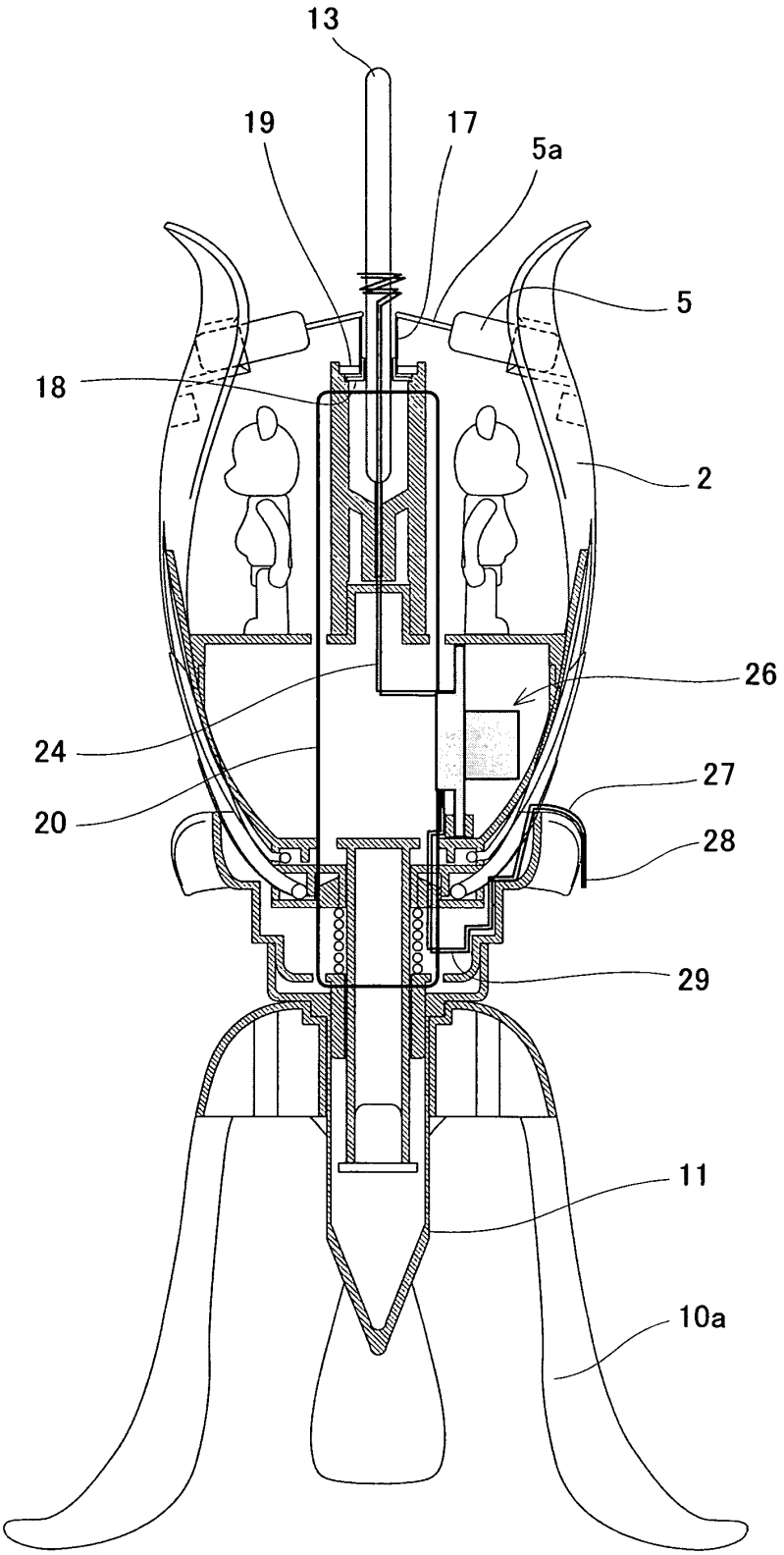


Fig. 7

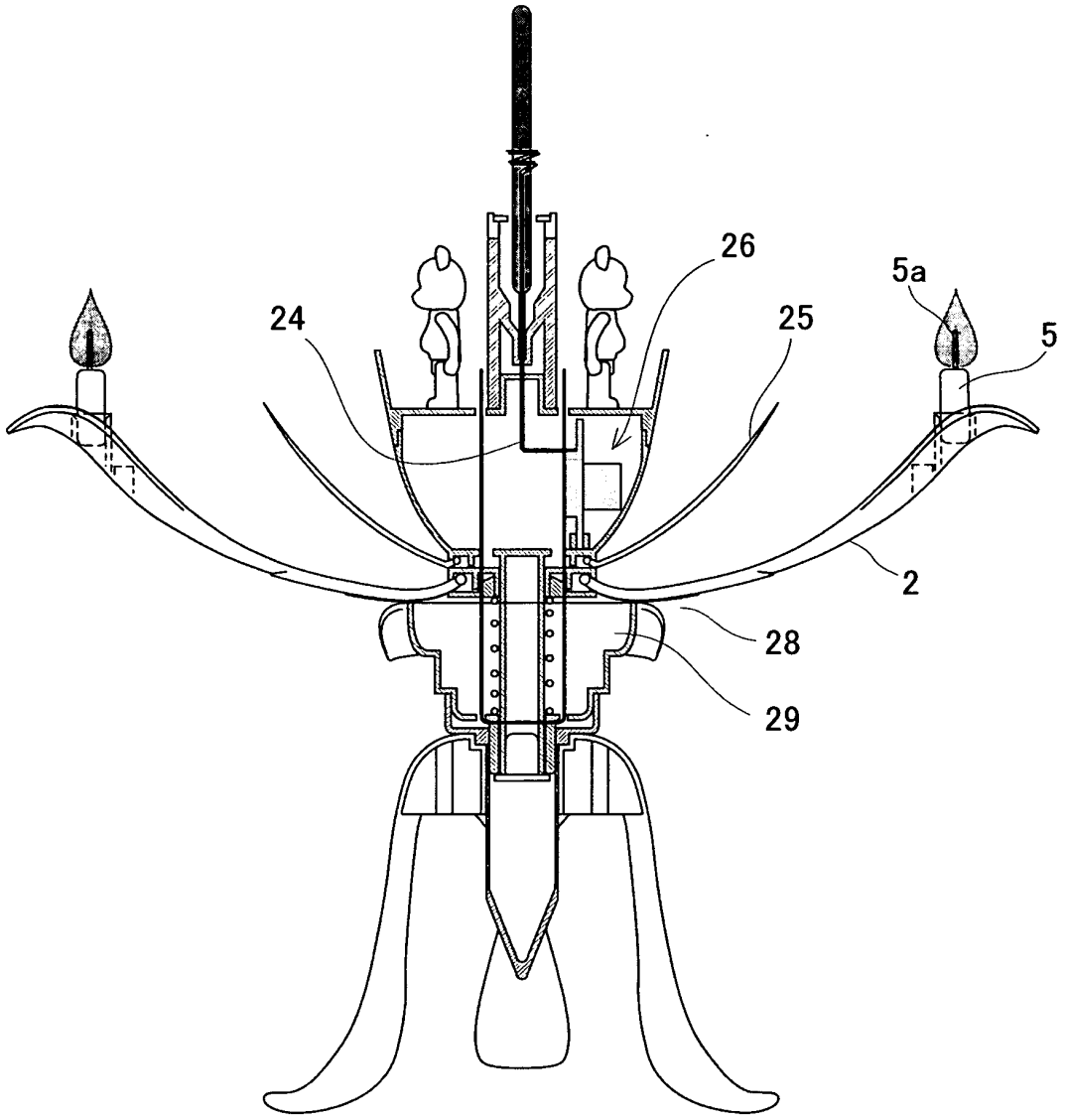


Fig. 8

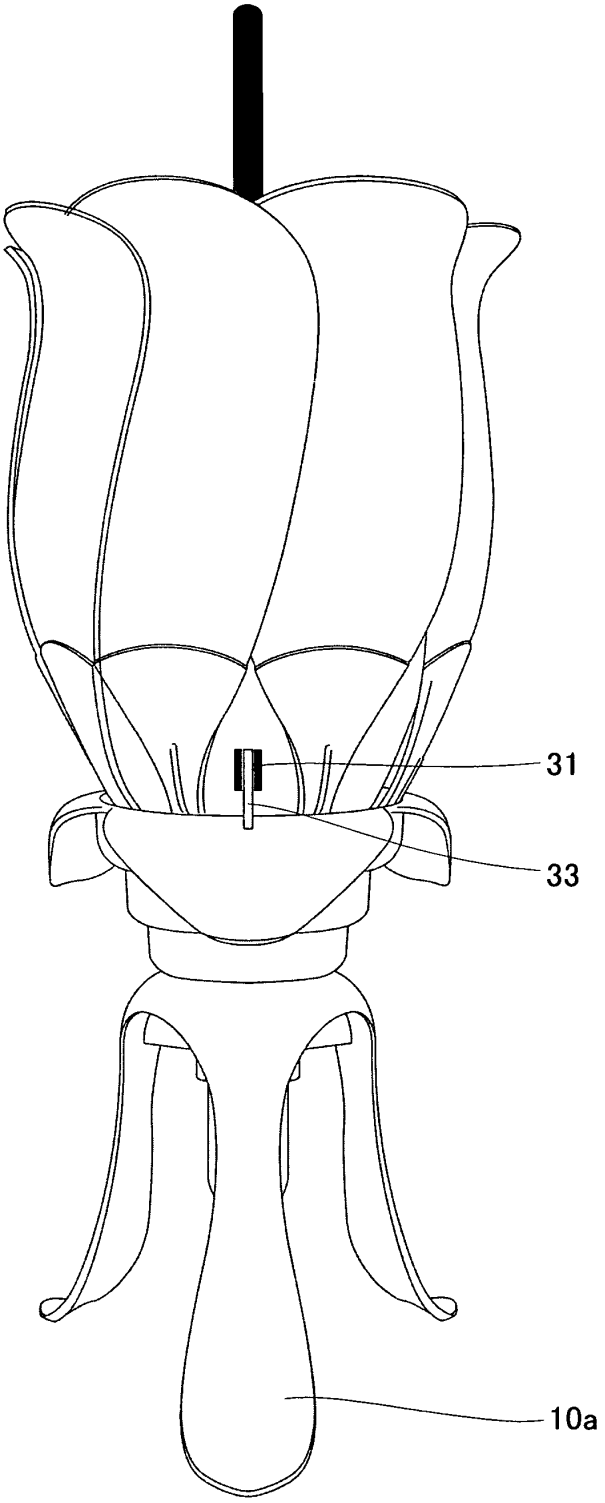


Fig. 9

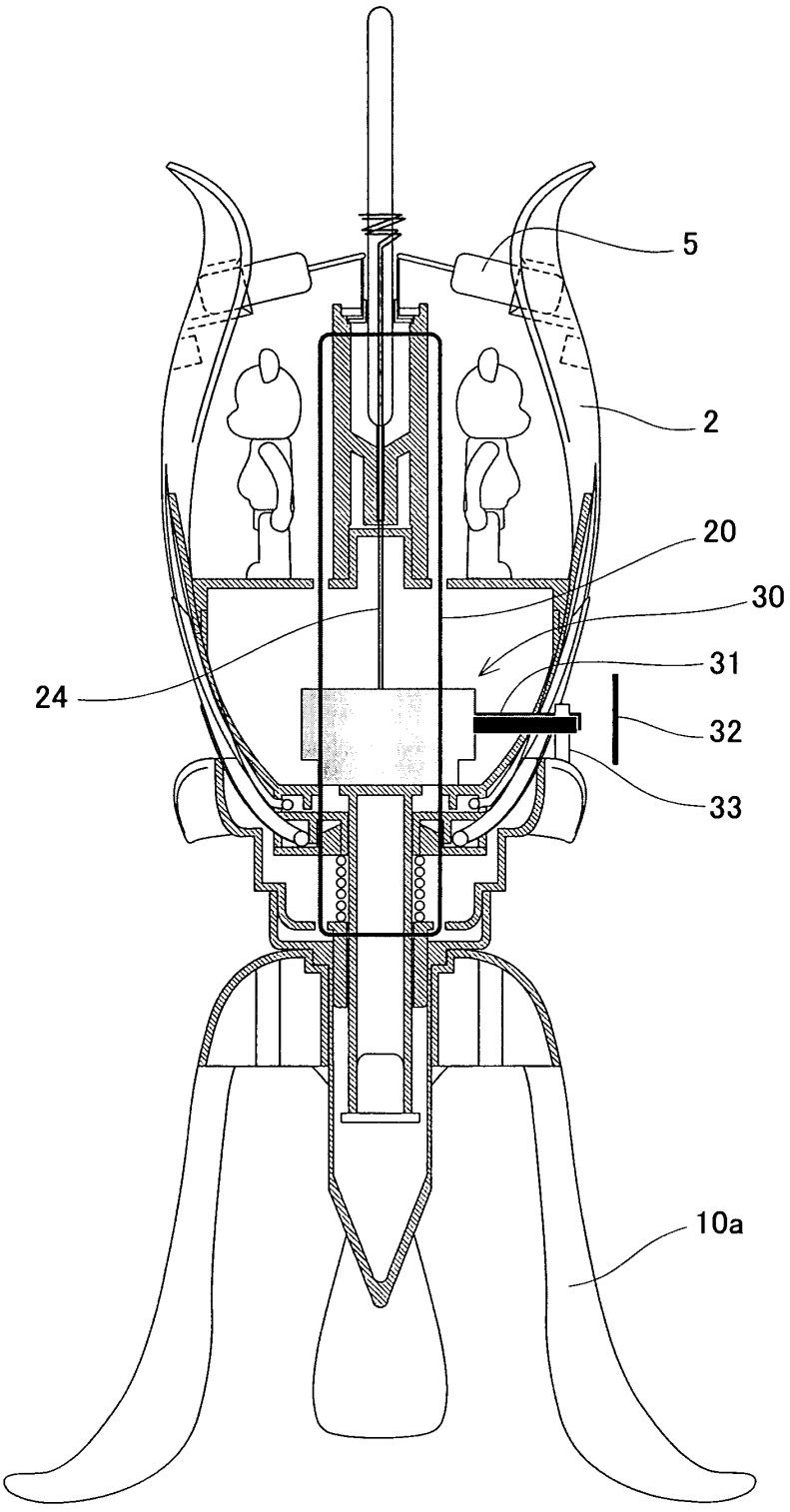


Fig. 10

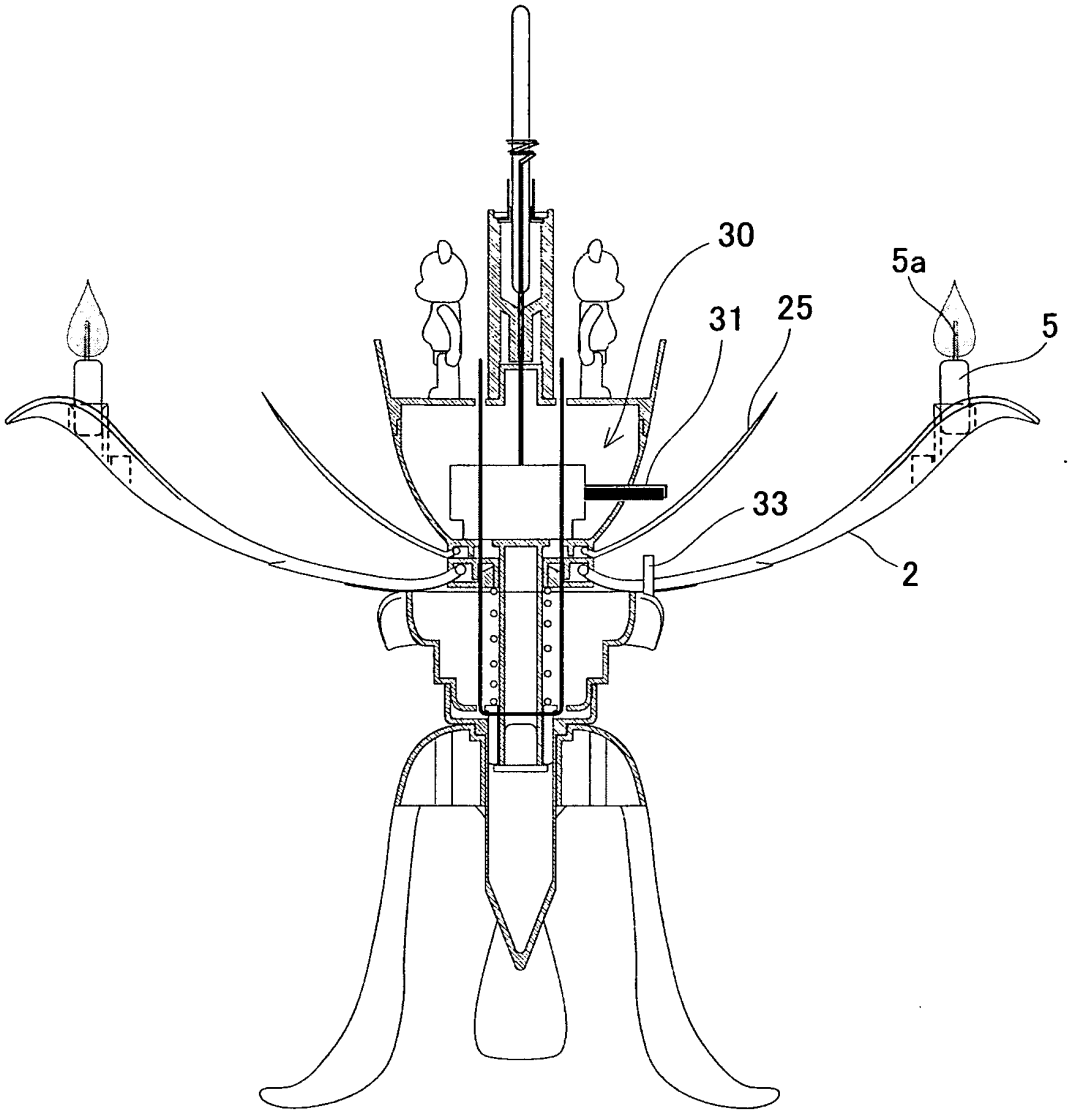


Fig. 11

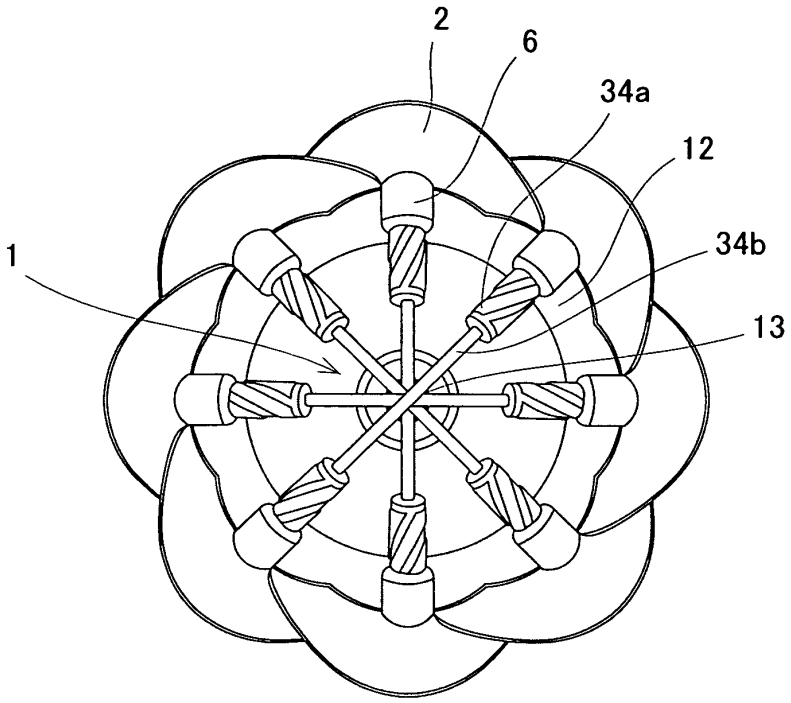


Fig. 12(a)

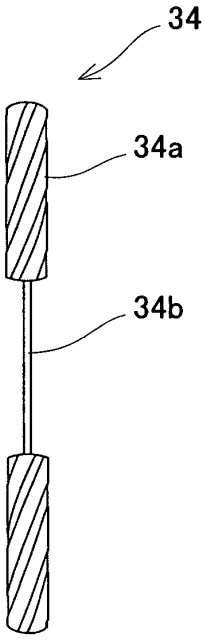


Fig. 12(b)

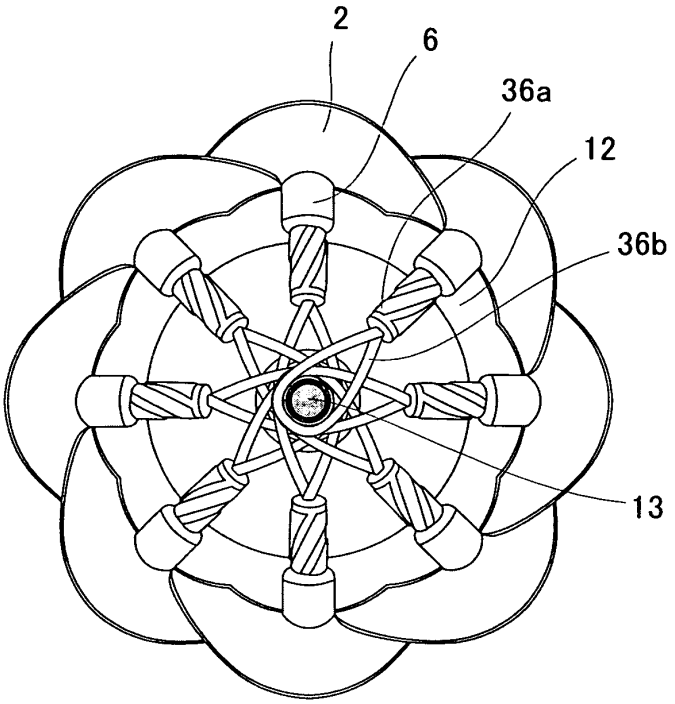


Fig. 13(a)

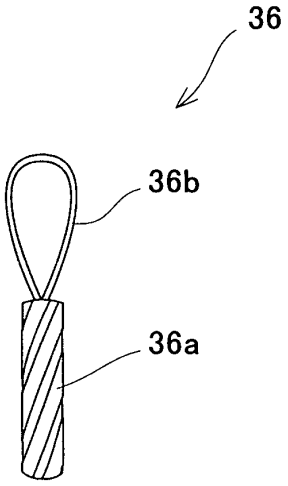


Fig. 13(b)

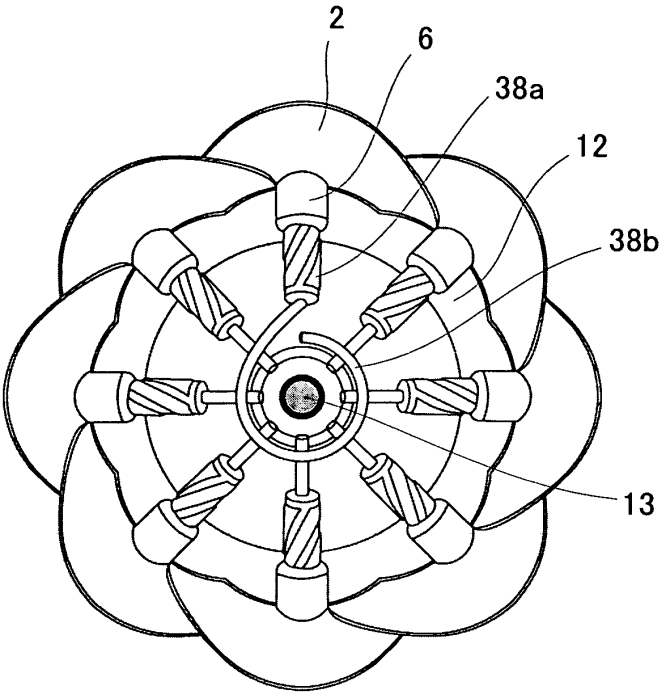


Fig. 14(a)

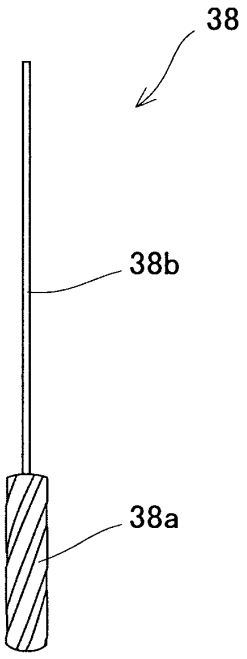


Fig. 14(b)

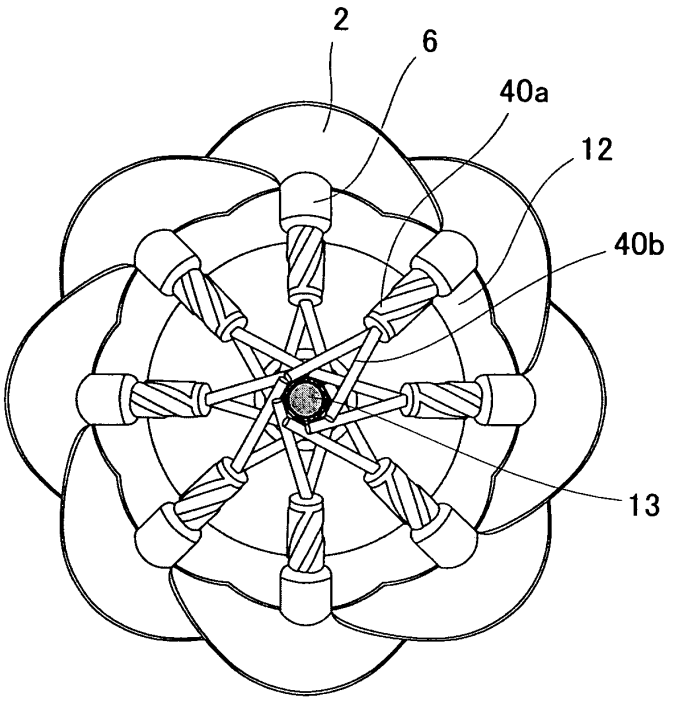


Fig. 15(a)

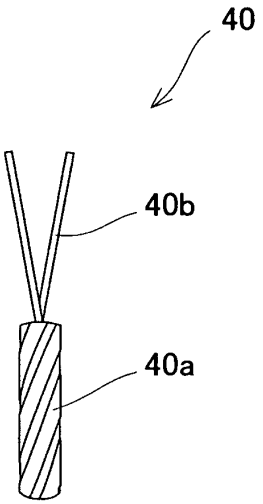


Fig. 15(b)

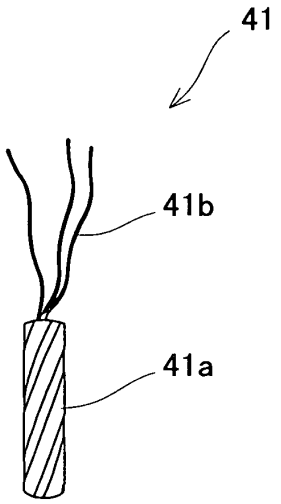


Fig. 15(c)

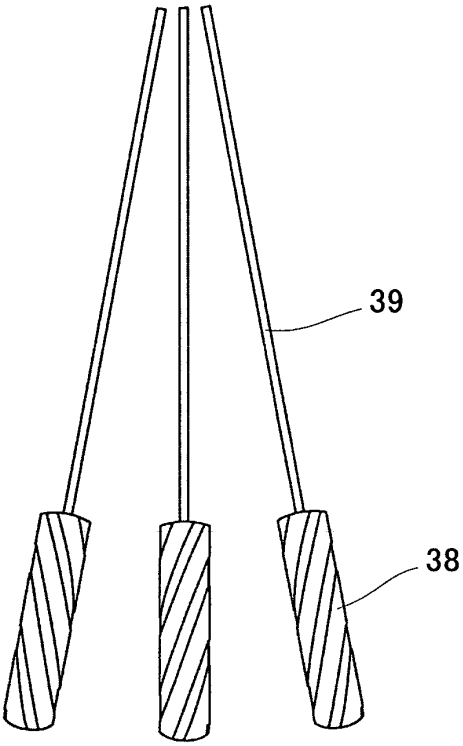


Fig. 16(a)

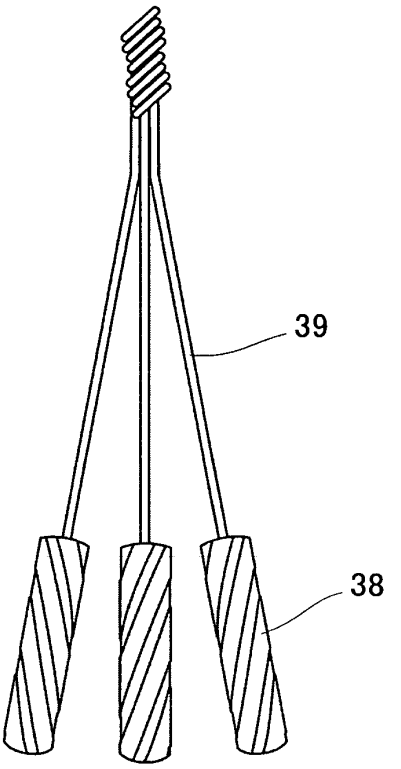


Fig. 16(b)

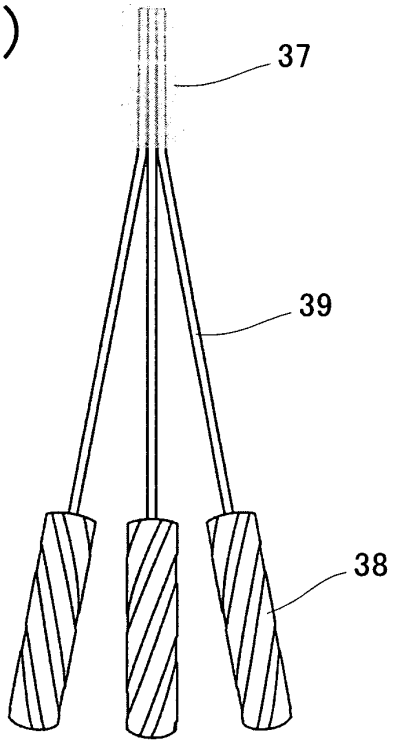


Fig. 16(c)

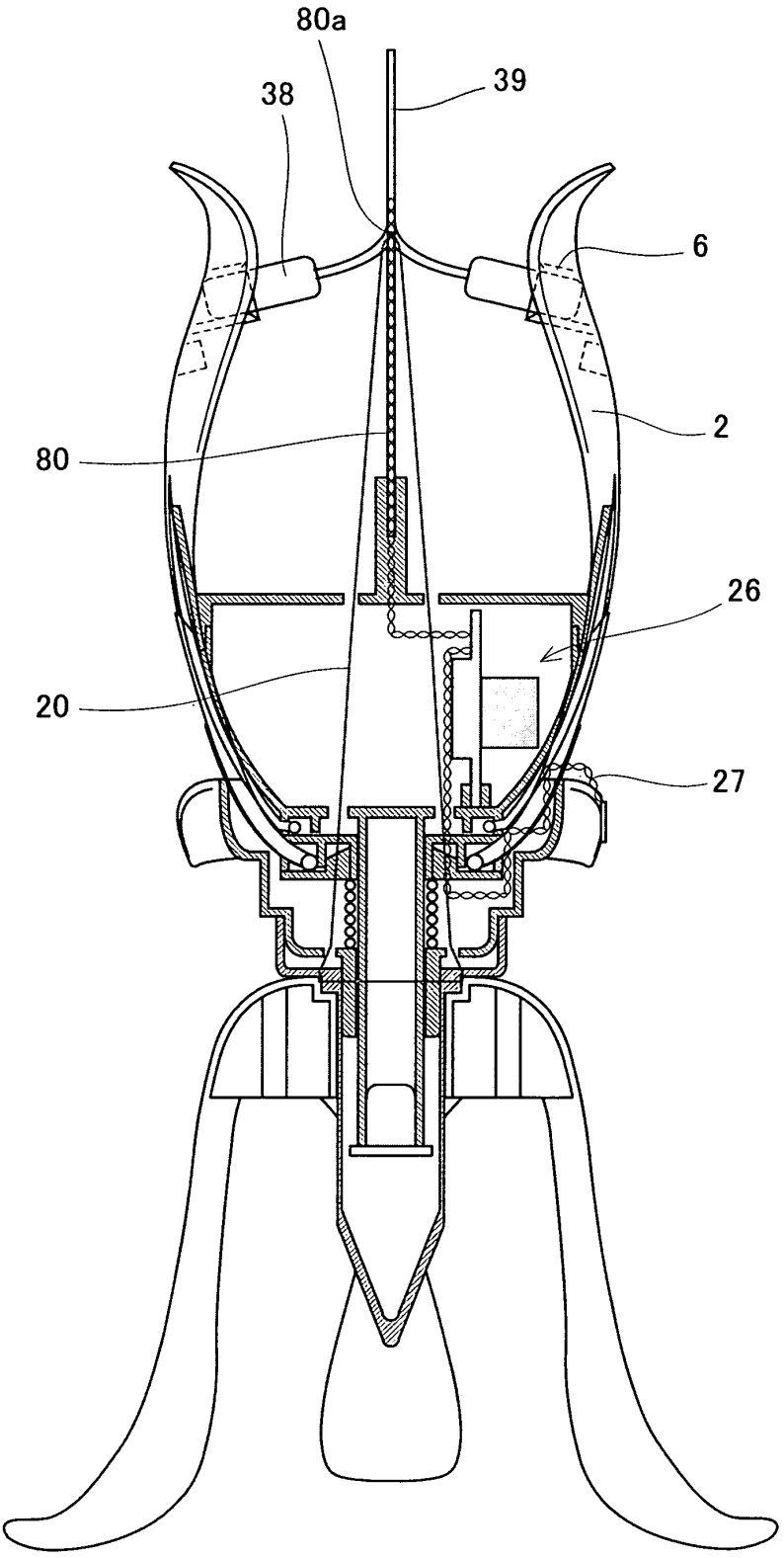


Fig. 17

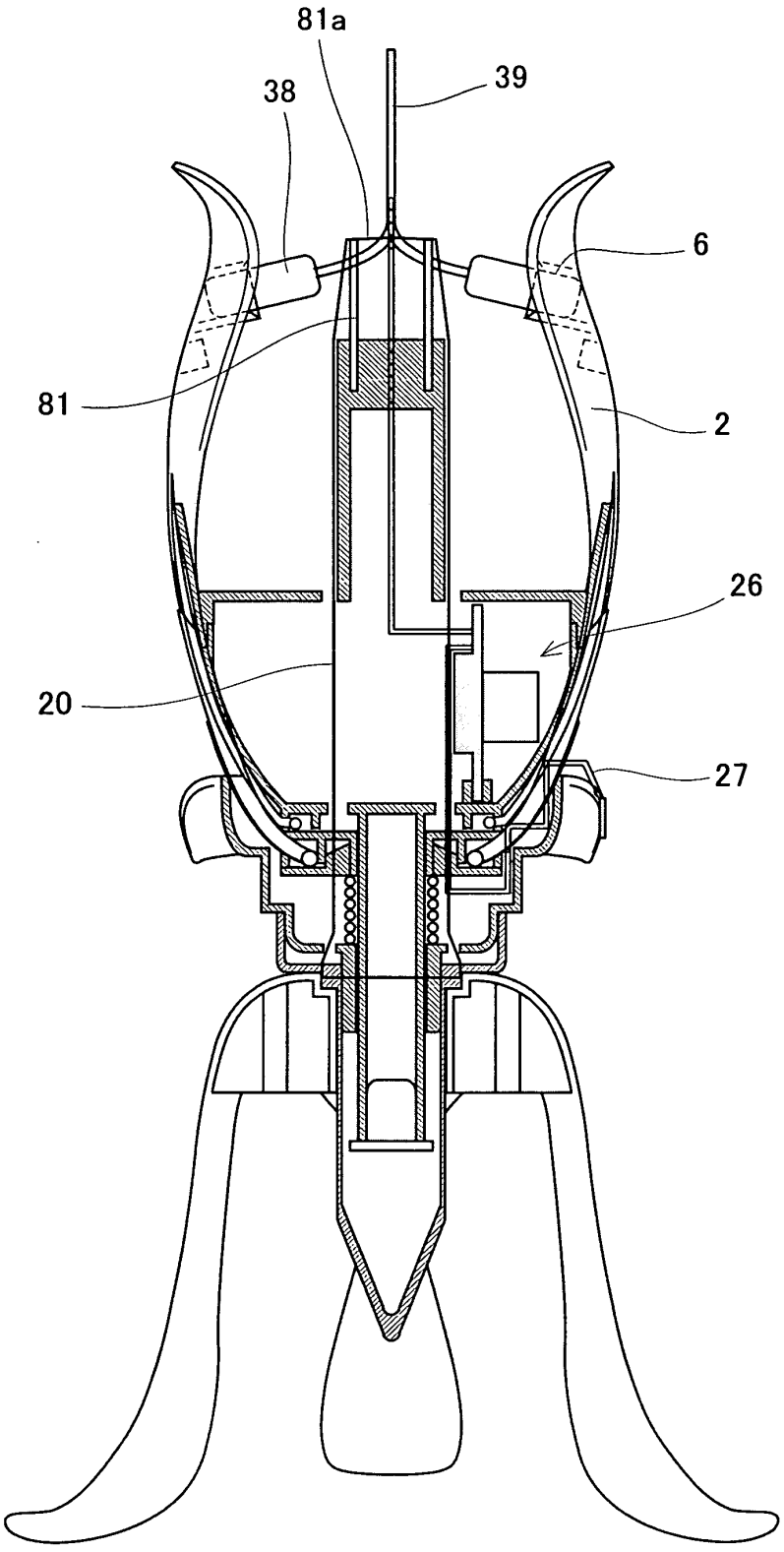


Fig. 18

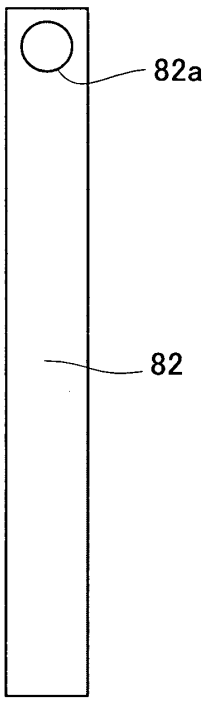


Fig. 19 (a)

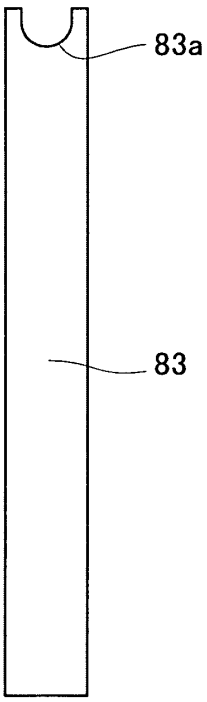


Fig. 19 (b)

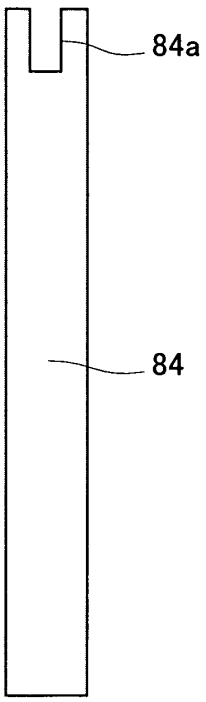


Fig. 19 (c)

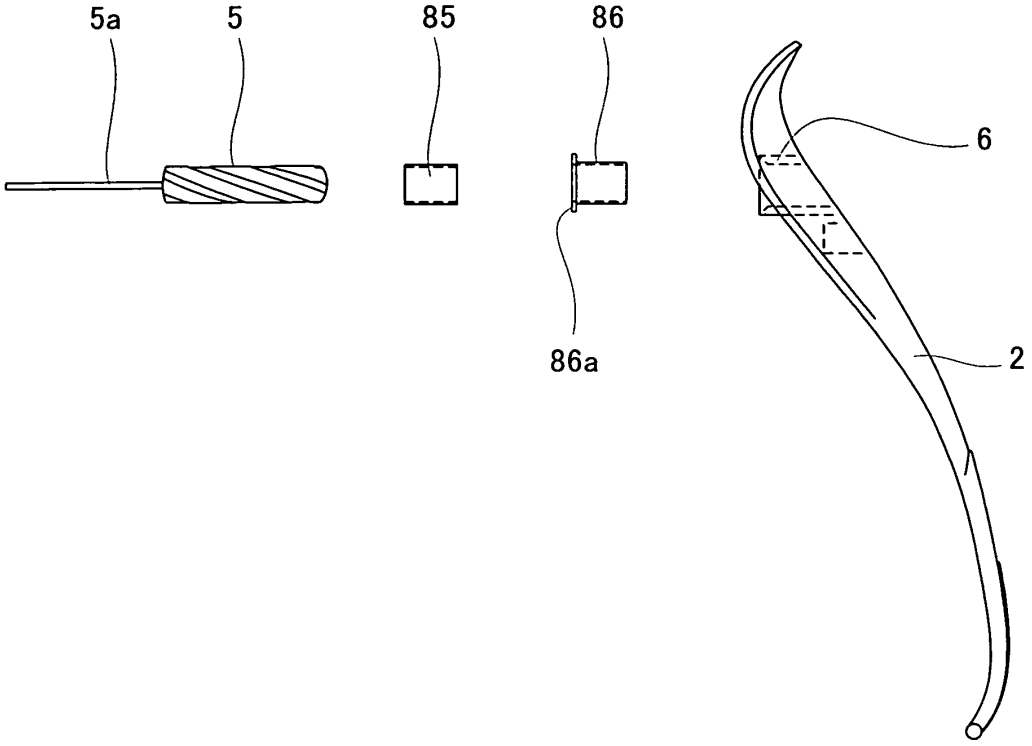


Fig. 20－1(a)

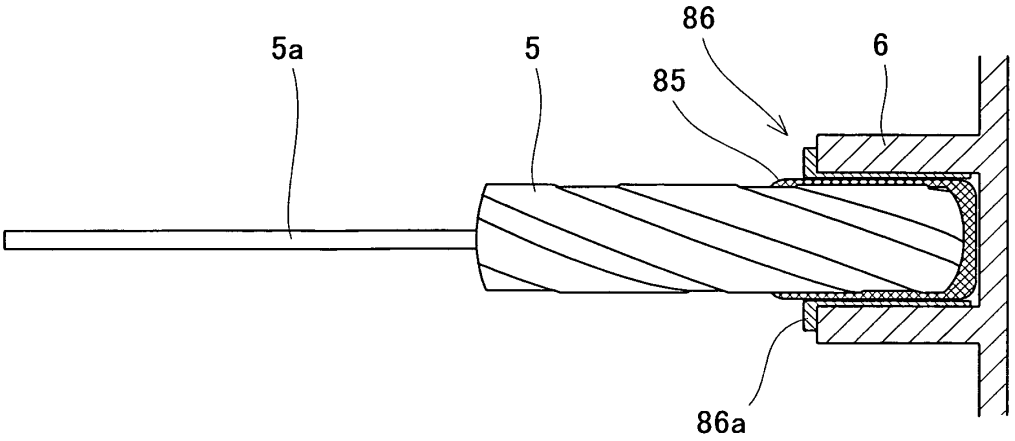


Fig. 20－1(b)

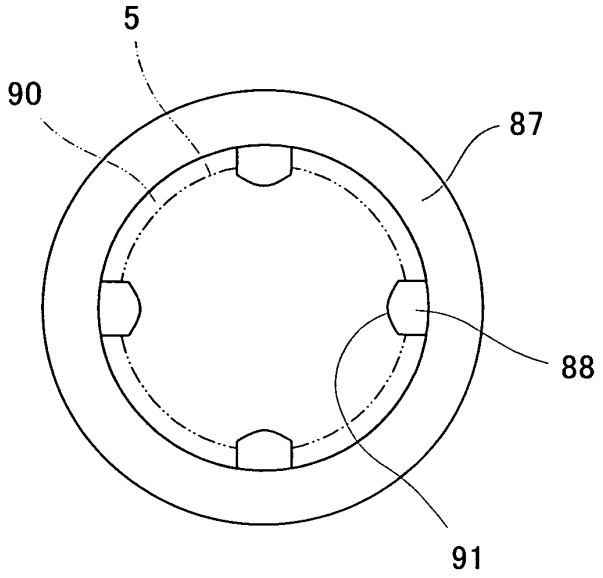


Fig. 20－2(a)

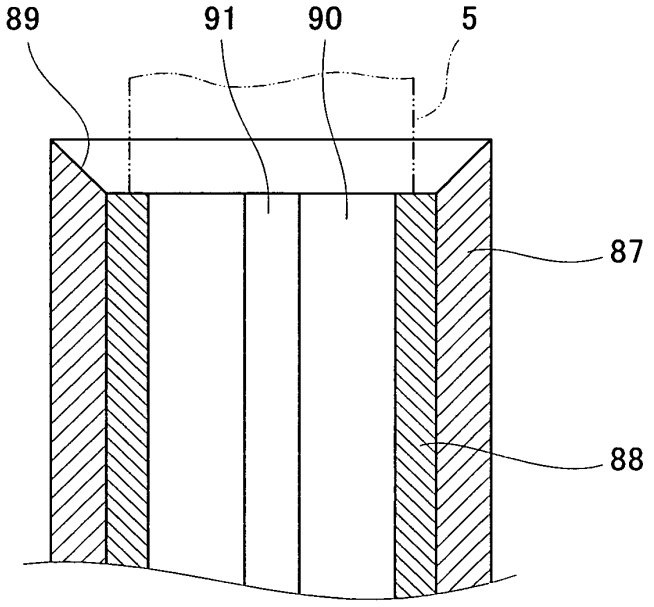


Fig. 20－2(b)

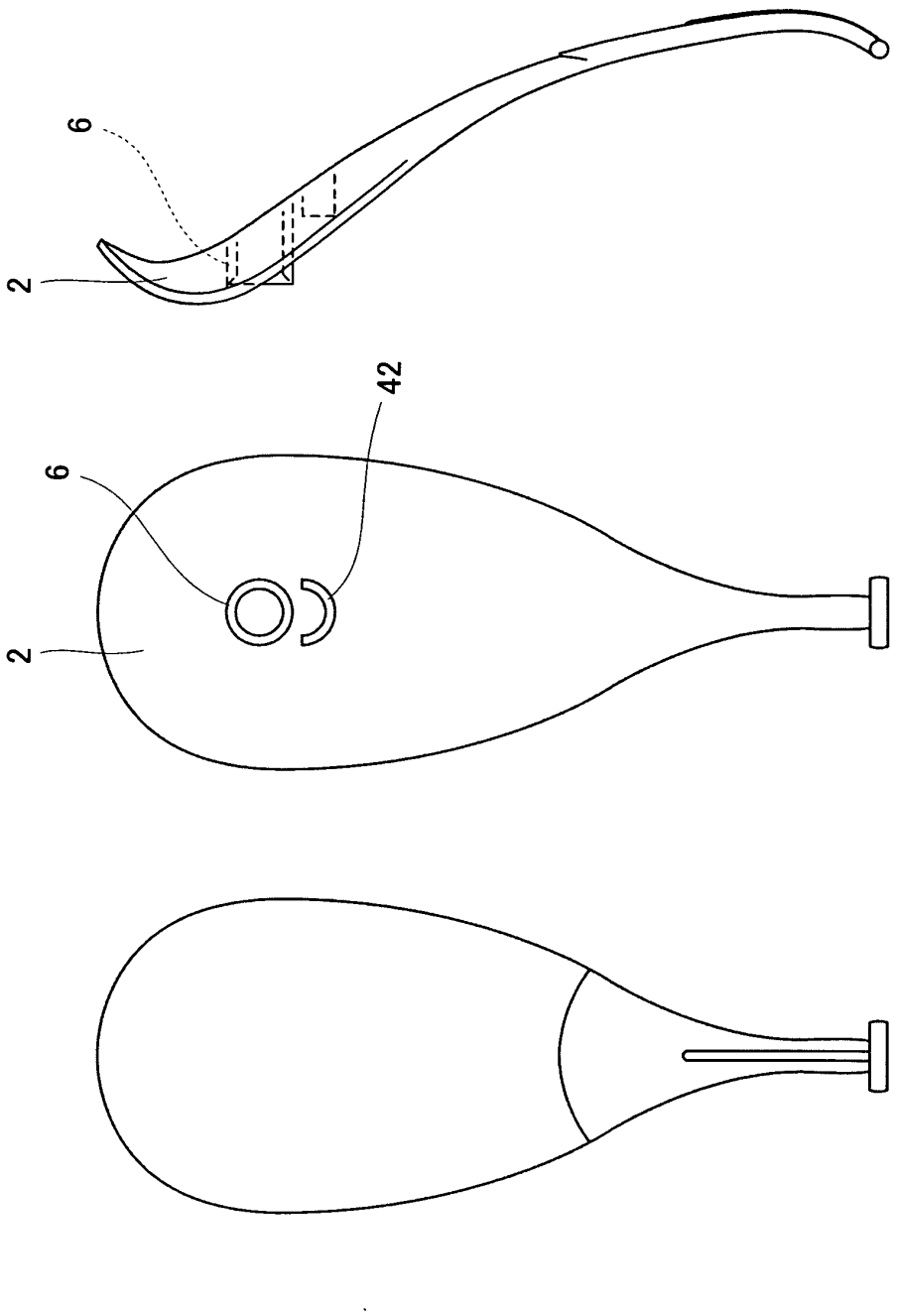


Fig. 21(a) Fig. 21(b) Fig. 21(c)

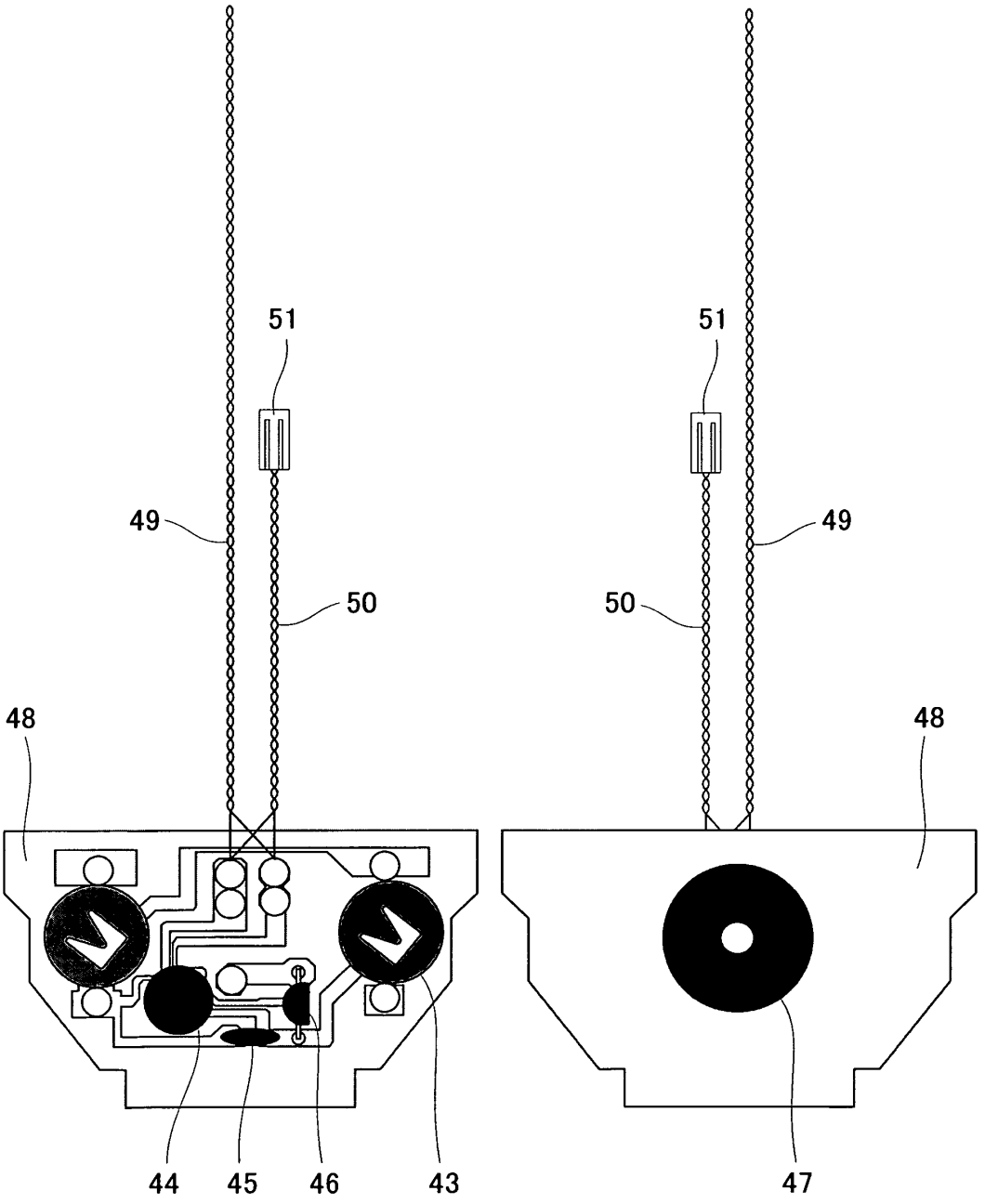


Fig. 22(a) Fig. 22(b)

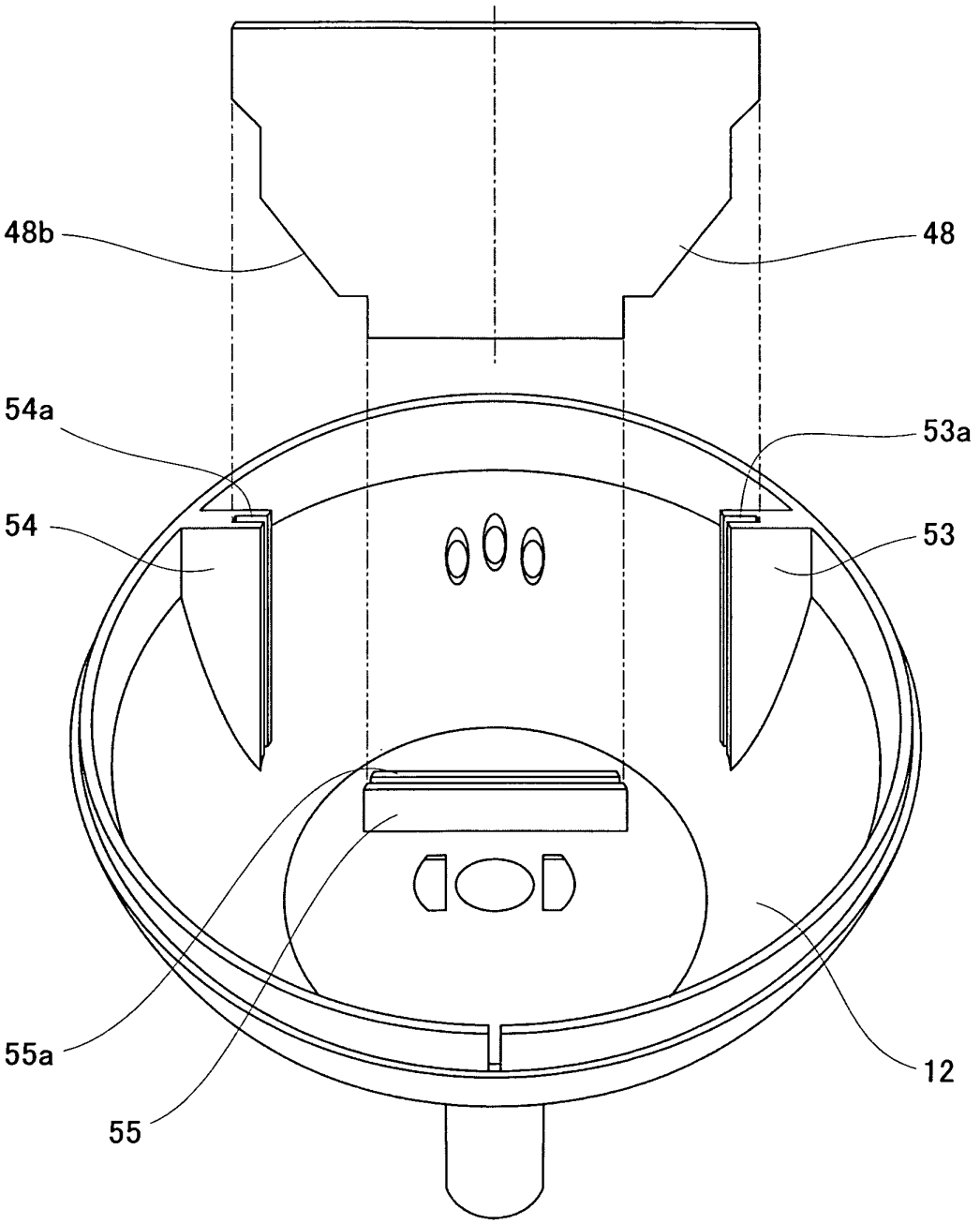


Fig. 23

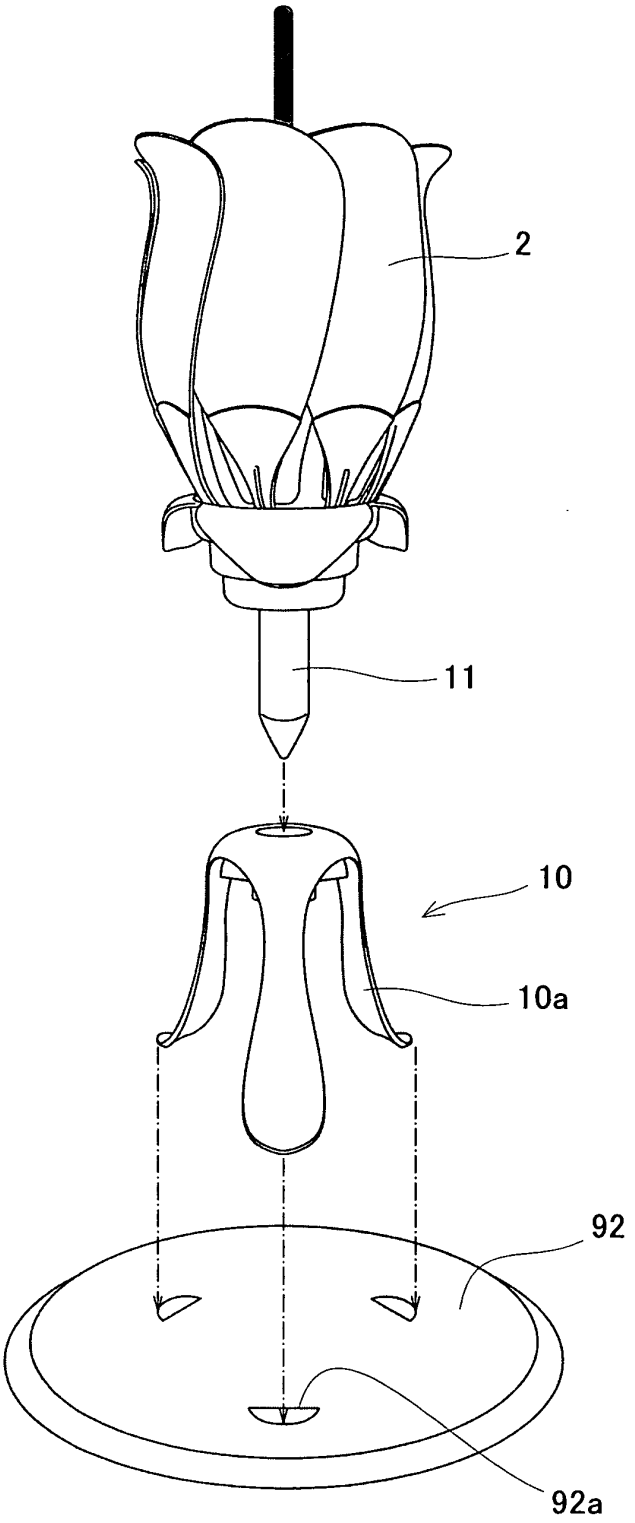
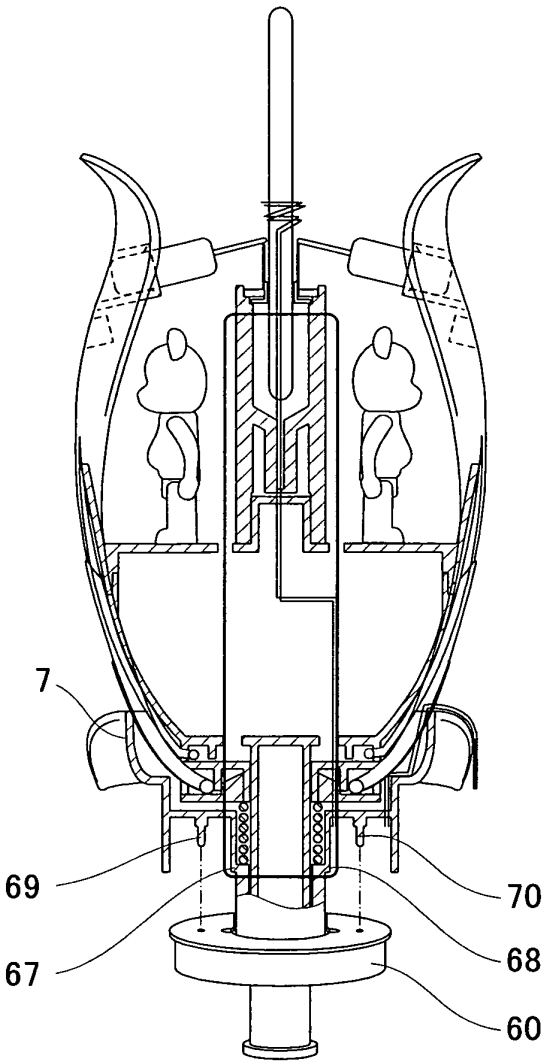


Fig. 24



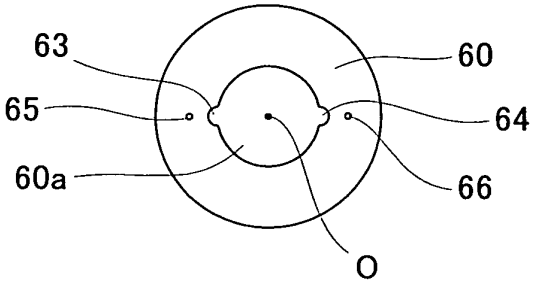


Fig. 25

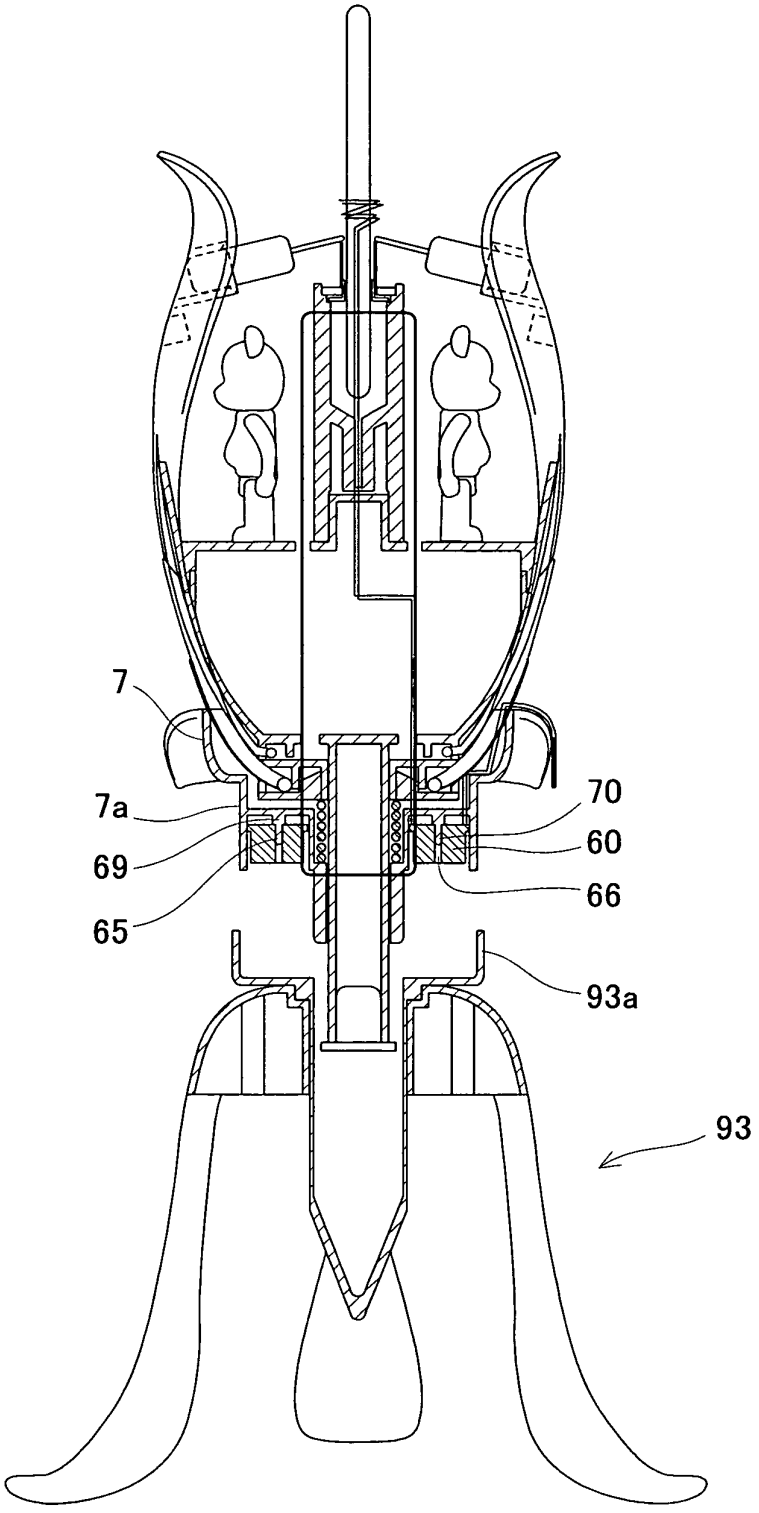


Fig. 26

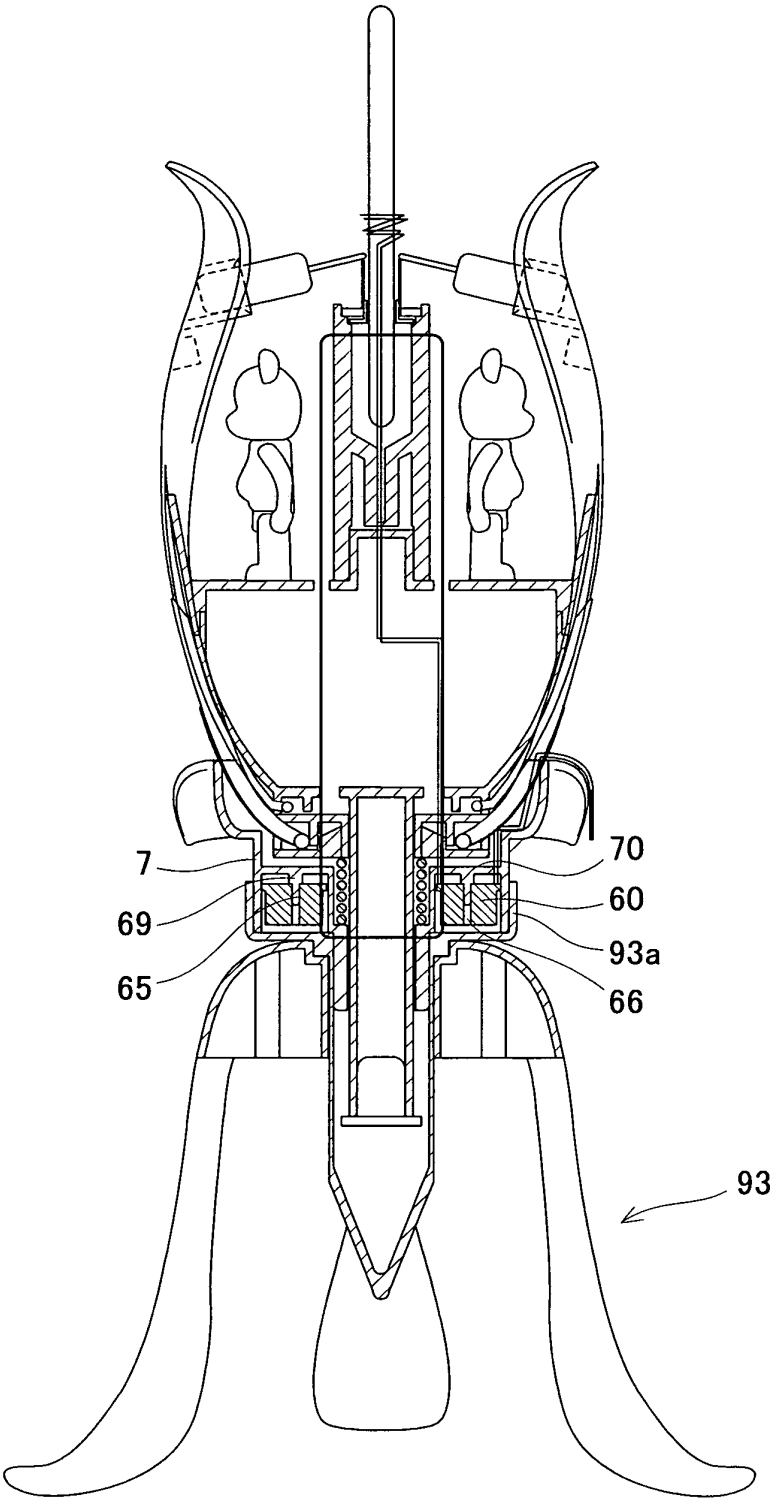


Fig. 27

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/317302

A. CLASSIFICATION OF SUBJECT MATTER
F21V35/00(2006.01)i, *F21S13/12*(2006.01)i

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)
F21V35/00, F21S13/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2006
Kokai Jitsuyo Shinan Koho 1971-2006 Toroku Jitsuyo Shinan Koho 1994-2006

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	JP 3107185 U (Cho Jishoku), 27 January, 2005 (27.01.05), Full text; all drawings (Family: none)	1,5 6,10-12 2-4,7-9
Y	JP 2004-200136 A (Tanaka Kanesuke Syoji Inc.), 15 July, 2004 (15.07.04), Par. No. [0025]; Fig. 4 (Family: none)	6
Y	JP 3061784 U (Ken'ichi FUKUI), 24 September, 1999 (24.09.99), Figs. 1, 2 (Family: none)	10

☒ 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	Date of mailing of the international search report
27 September, 2006 (27.09.06)	10 October, 2006 (10.10.06)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/317302

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2002-38192 A (Kabushiki Kaisha Makimura), 06 February, 2002 (06.02.02), Figs. 1, 2, 3 (Family: none)	11,12

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

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 2004200136 A **[0009]**