US 20120142248A1

(19) **United States**

(12) **Patent Application Publication**

MURAYAMA et al.

(10) **Pub. No.: US 2012/0142248 A1**

(43) **Pub. Date: Jun. 7, 2012**

(54) **OPERATING TOY**

(75) Inventors: **Takamichi MURAYAMA**, Chiba (JP); **Kengo Nakanishi**, Tokyo (JP); **Hokuto Furusawa**, Tochigi (JP); **Aya Uchiyama**, Tokyo (JP); **Hirotaka Hatayama**, Tokyo (JP)

(73) Assignee: **BANDAI CO., LTD.**, Tokyo (JP)

(21) Appl. No.: **13/304,787**

(22) Filed: **Nov. 28, 2011**

(30) **Foreign Application Priority Data**

Dec. 1, 2010 (JP) 2010-268397

Publication Classification

(51) **Int. Cl.**

A63H 3/28 (2006.01)

A63H 5/00 (2006.01)

(52) **U.S. Cl.** **446/297**; 446/397

(57) **ABSTRACT**

When a key member is inserted into a key cylinder attached to a toy main body, and in the case where the key member is inserted completely, the key member turns on a first switch, and it is checked that the key member is inserted completely. If in this state the key member is rotated, some of a plurality of second switches are turned on. According to the combination of second switches turned on at this time, sound and light are emitted in a predetermined pattern, and therefore the user feels that sound and light are emitted by their operation.

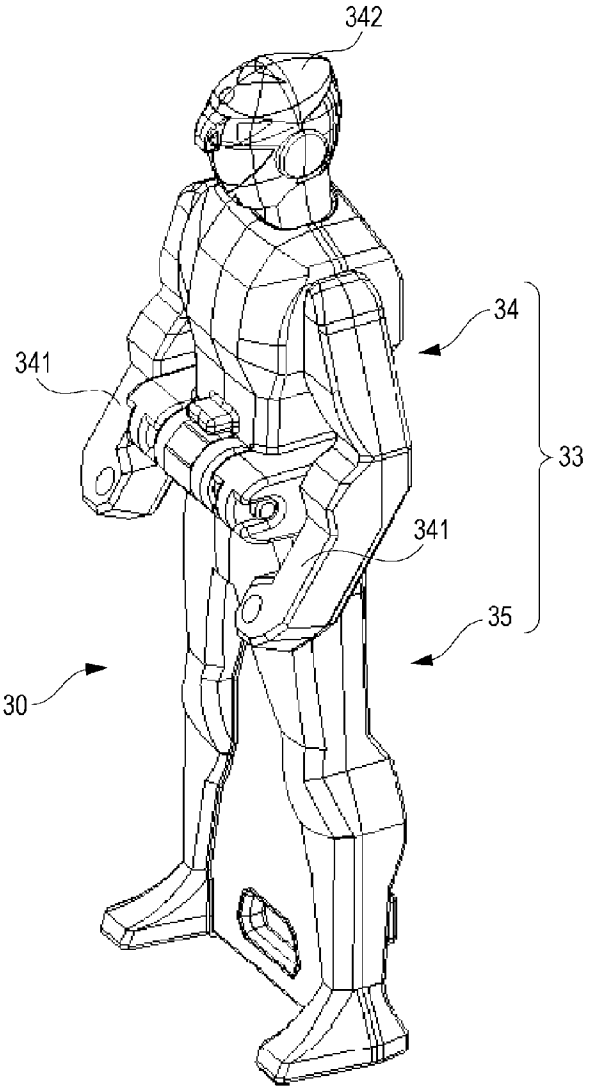


FIG. 1

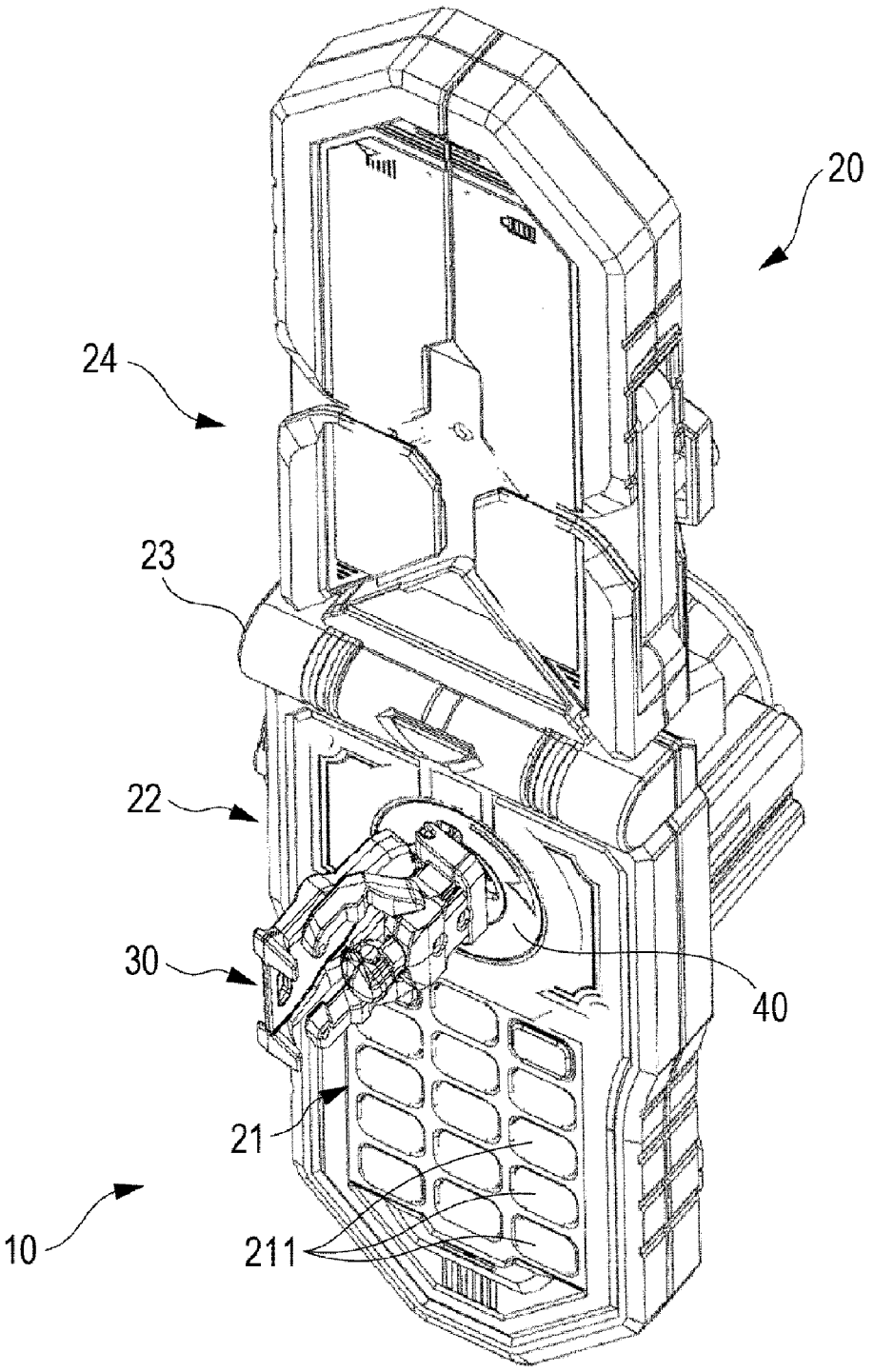


FIG. 2

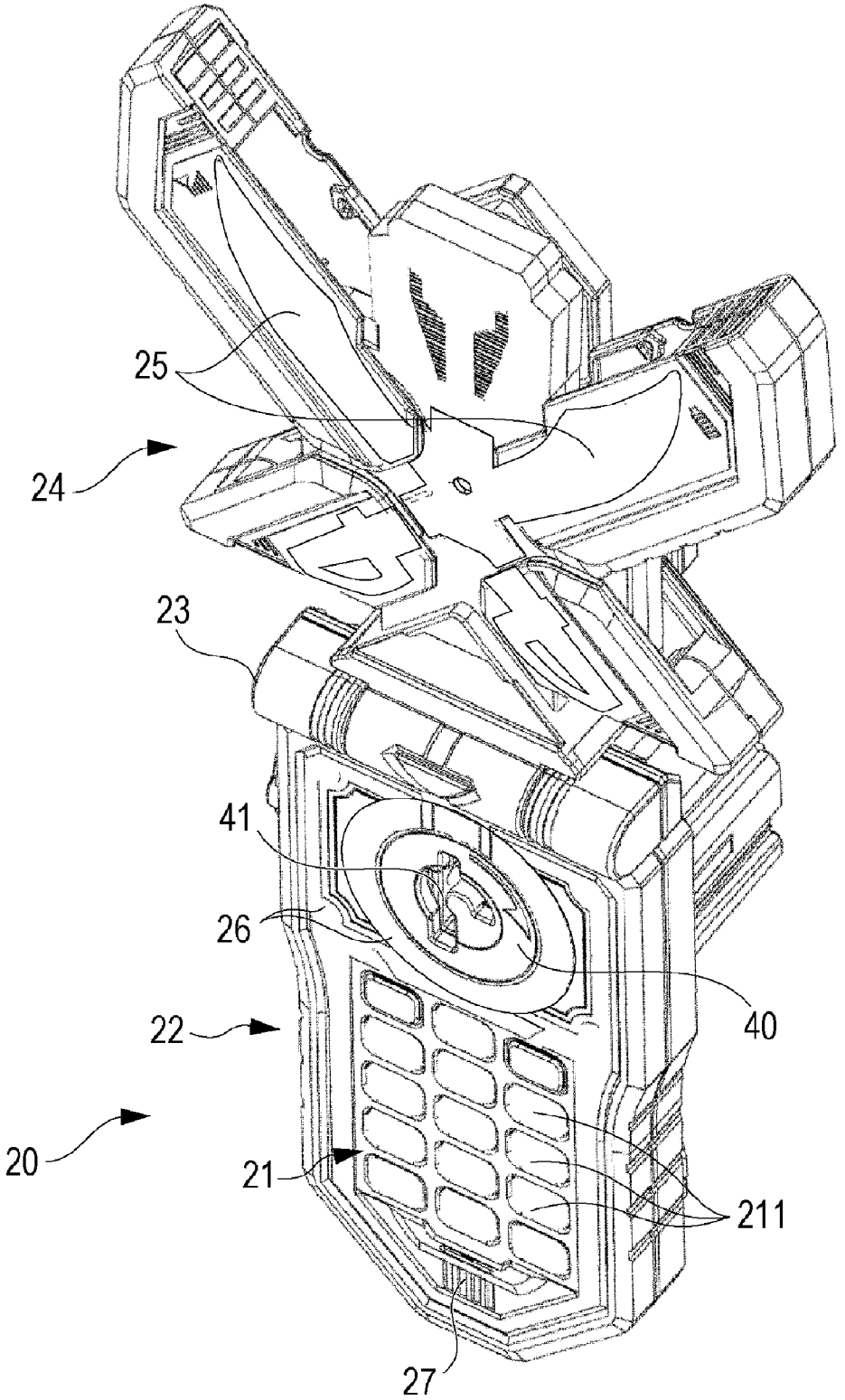


FIG. 3

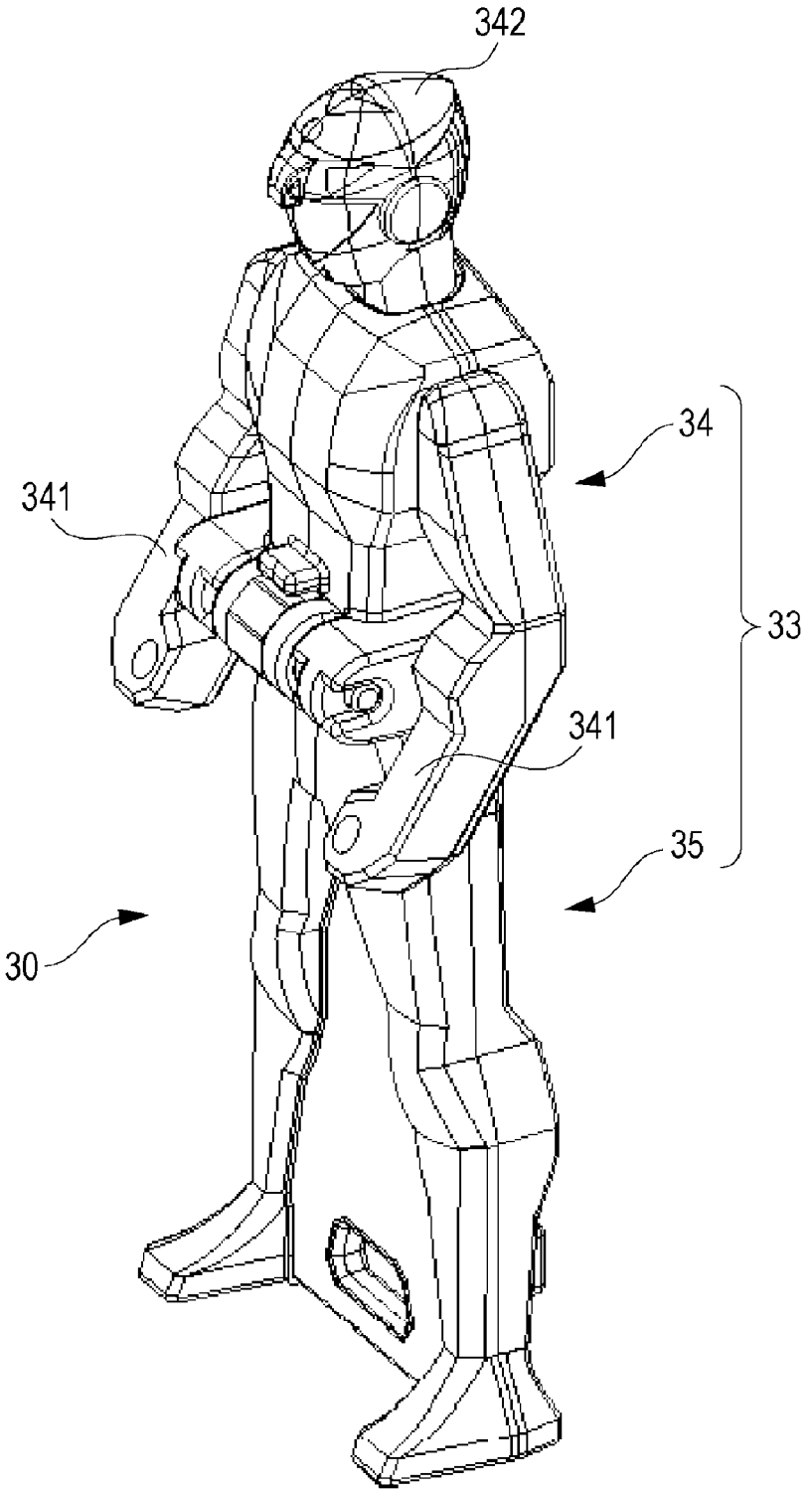


FIG. 4

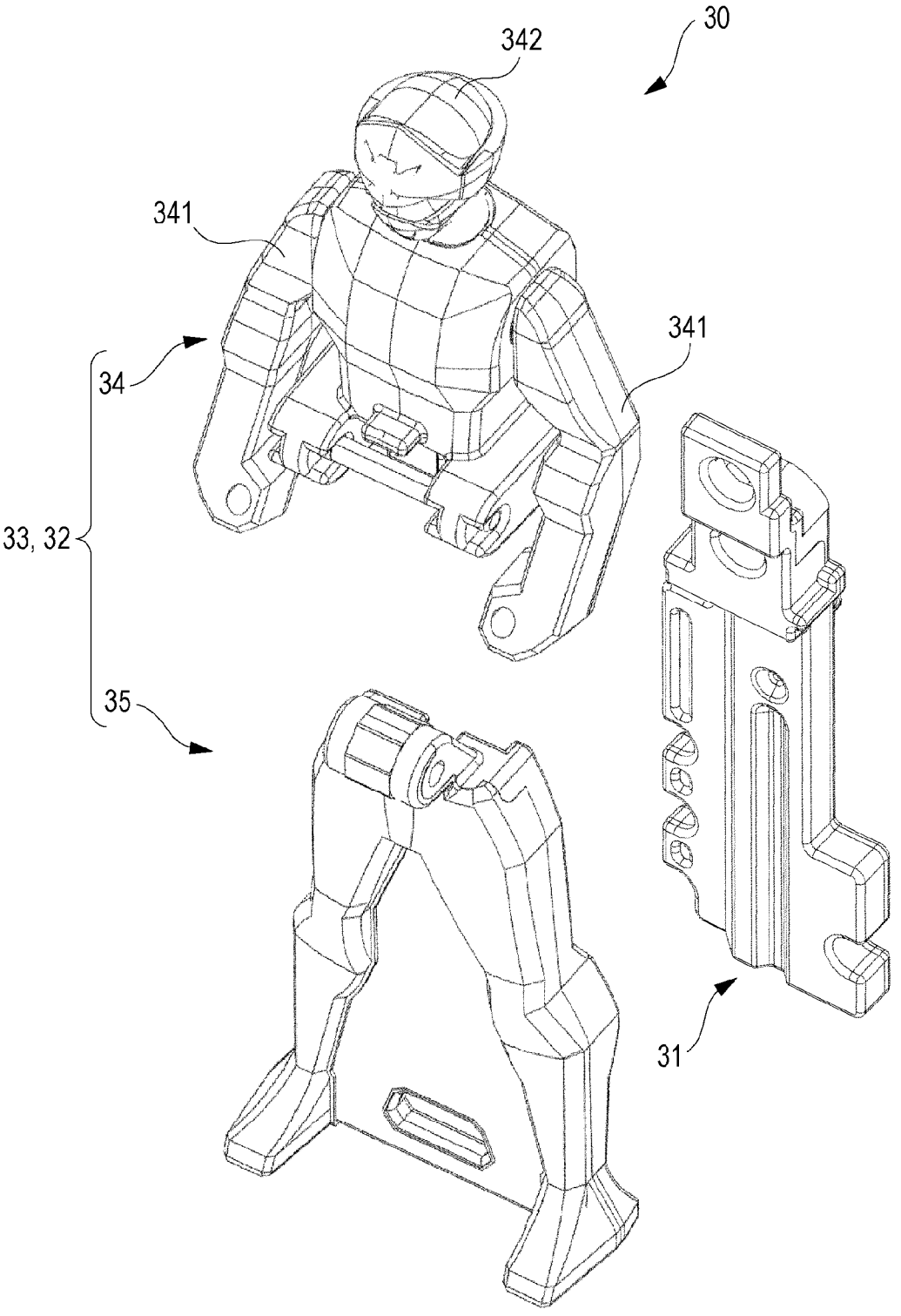


FIG. 5C

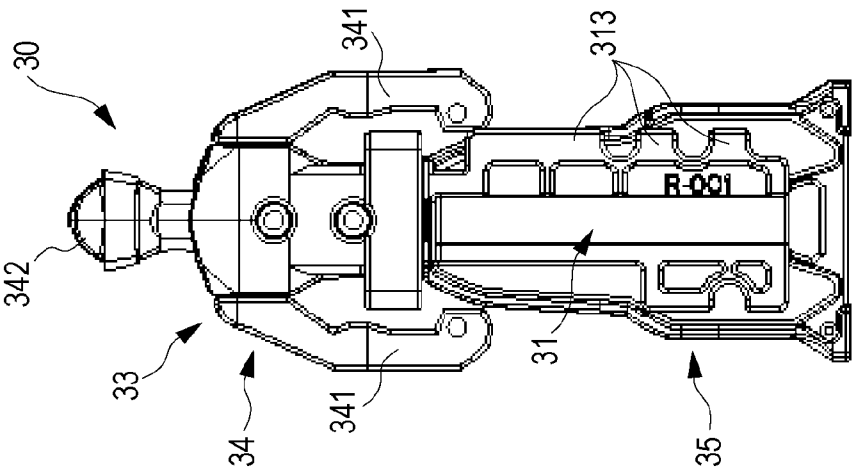


FIG. 5B

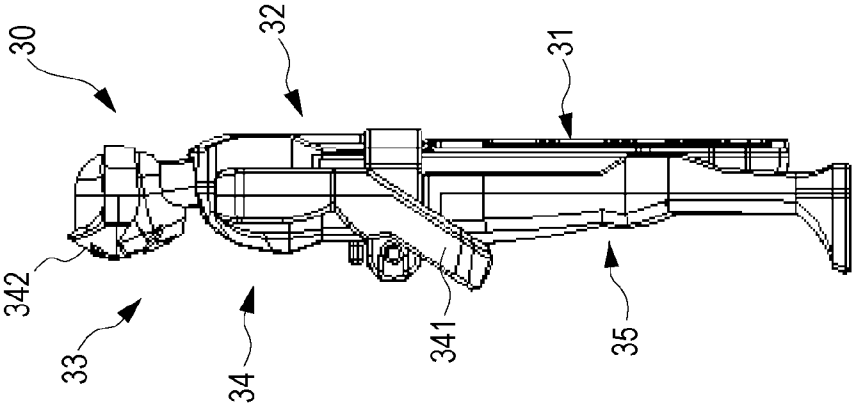


FIG. 5A

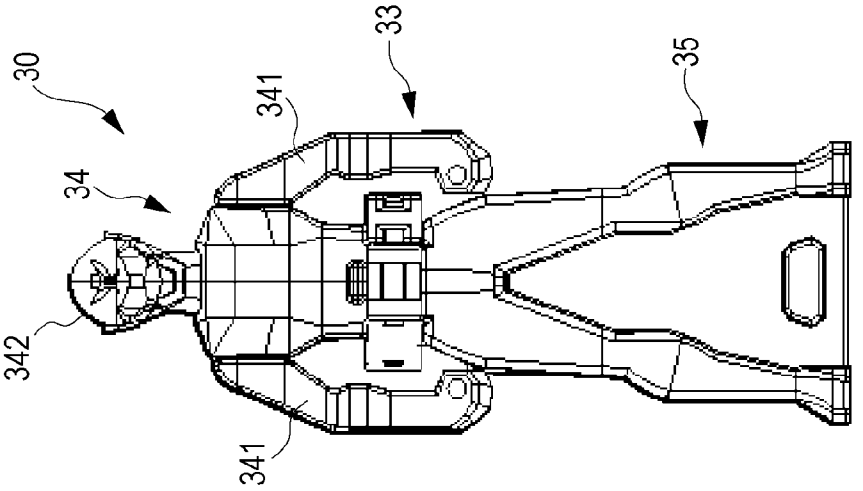


FIG. 6C

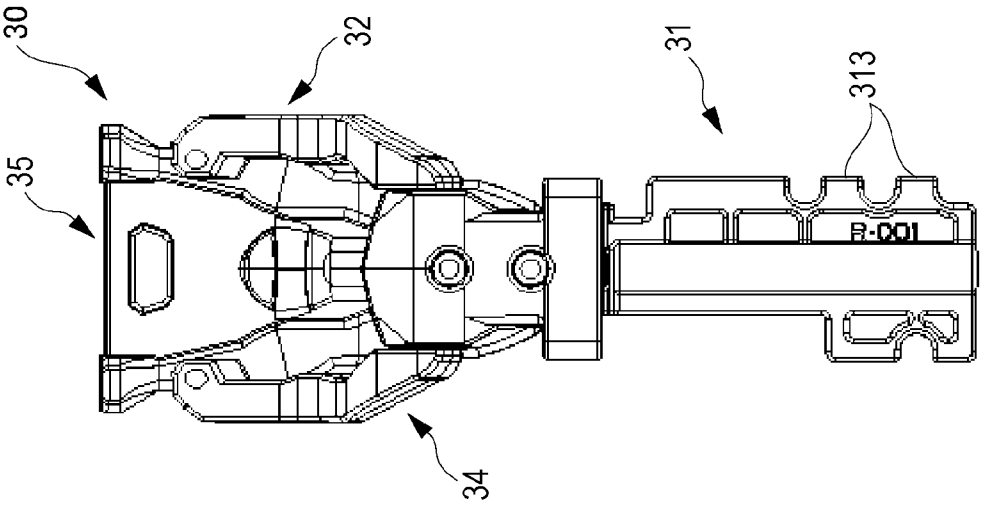


FIG. 6B

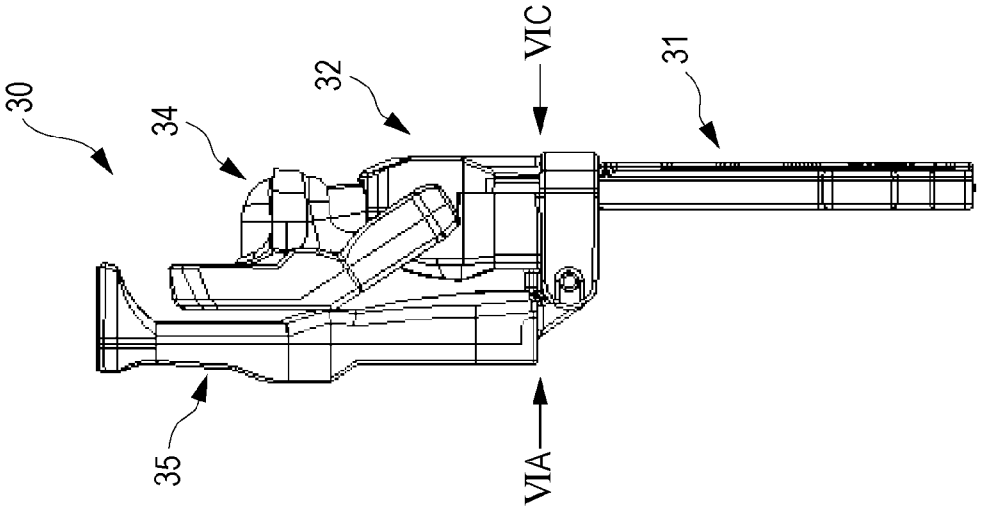


FIG. 6A

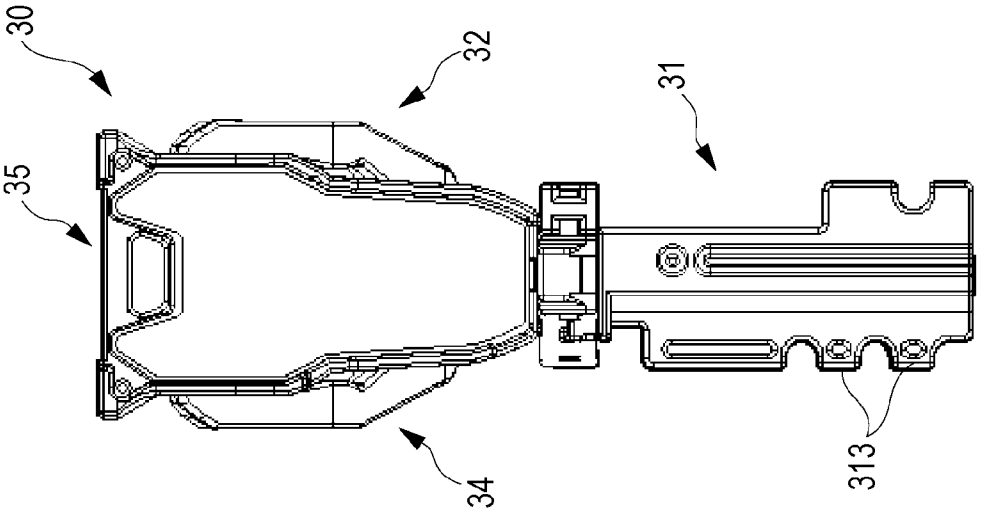


FIG. 7A

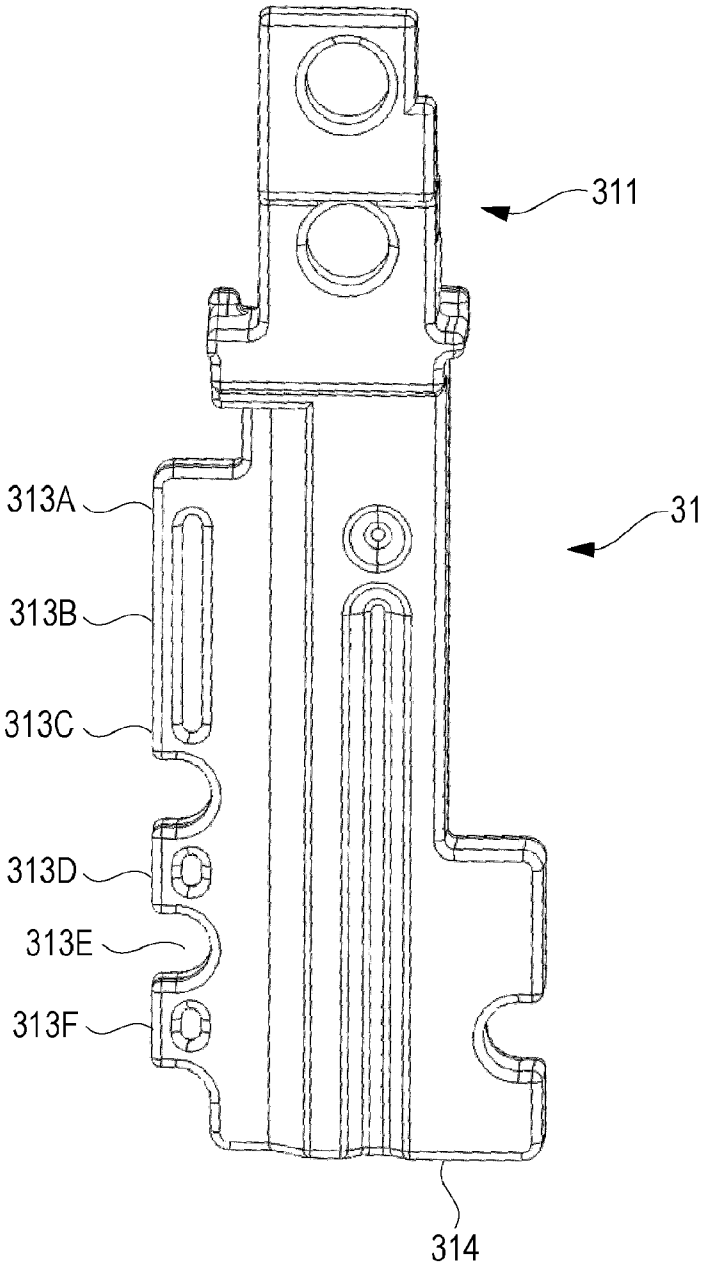


FIG. 7B

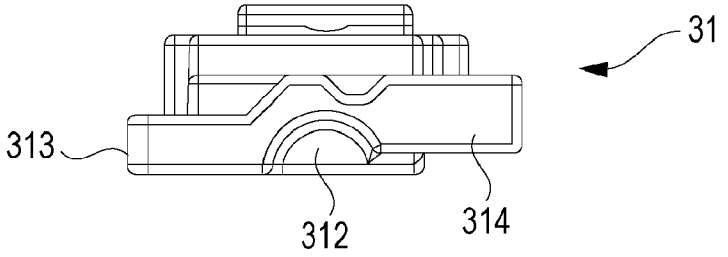


FIG. 8

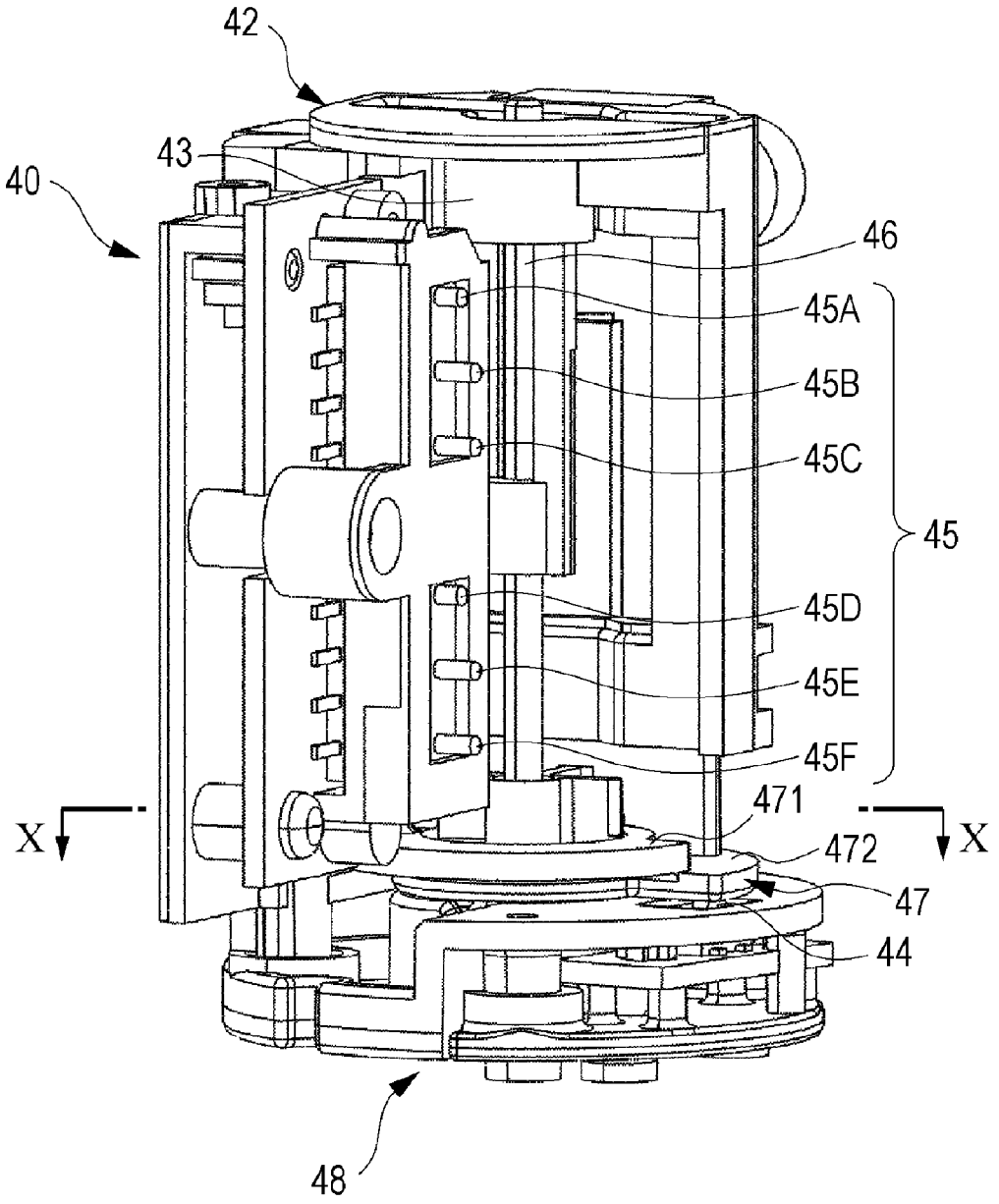


FIG. 9

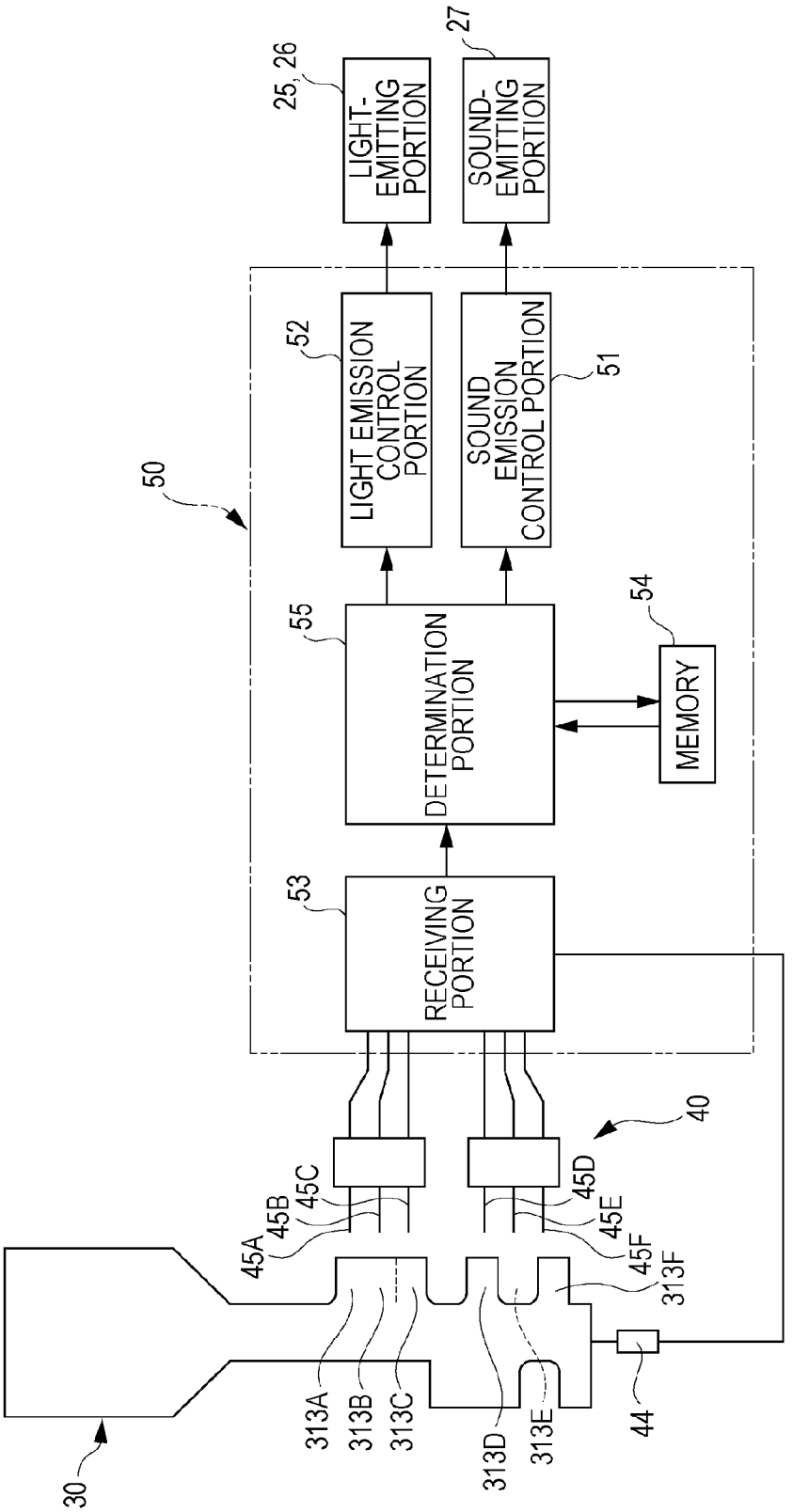

25, 26
LIGHT-EMITTING PORTION
27
SOUND-EMITTING PORTION
50
52
LIGHT EMISSION CONTROL PORTION
SOUND EMISSION CONTROL PORTION
51
55
DETERMINATION PORTION
54
MEMORY
53
RECEIVING PORTION
40
45A
45B
45C
45D
45E
45F
313F
313A
313B
313C
313D
313E
44
30

FIG. 10

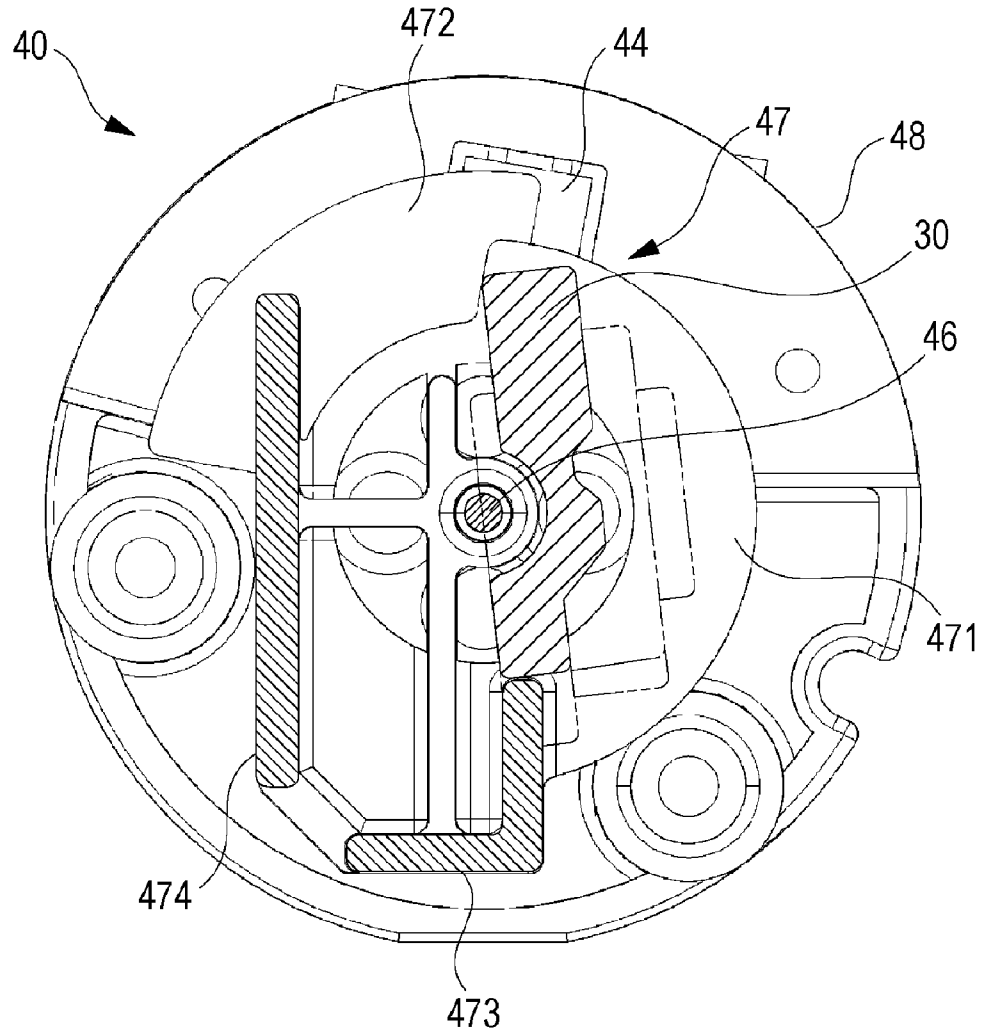


FIG. 11

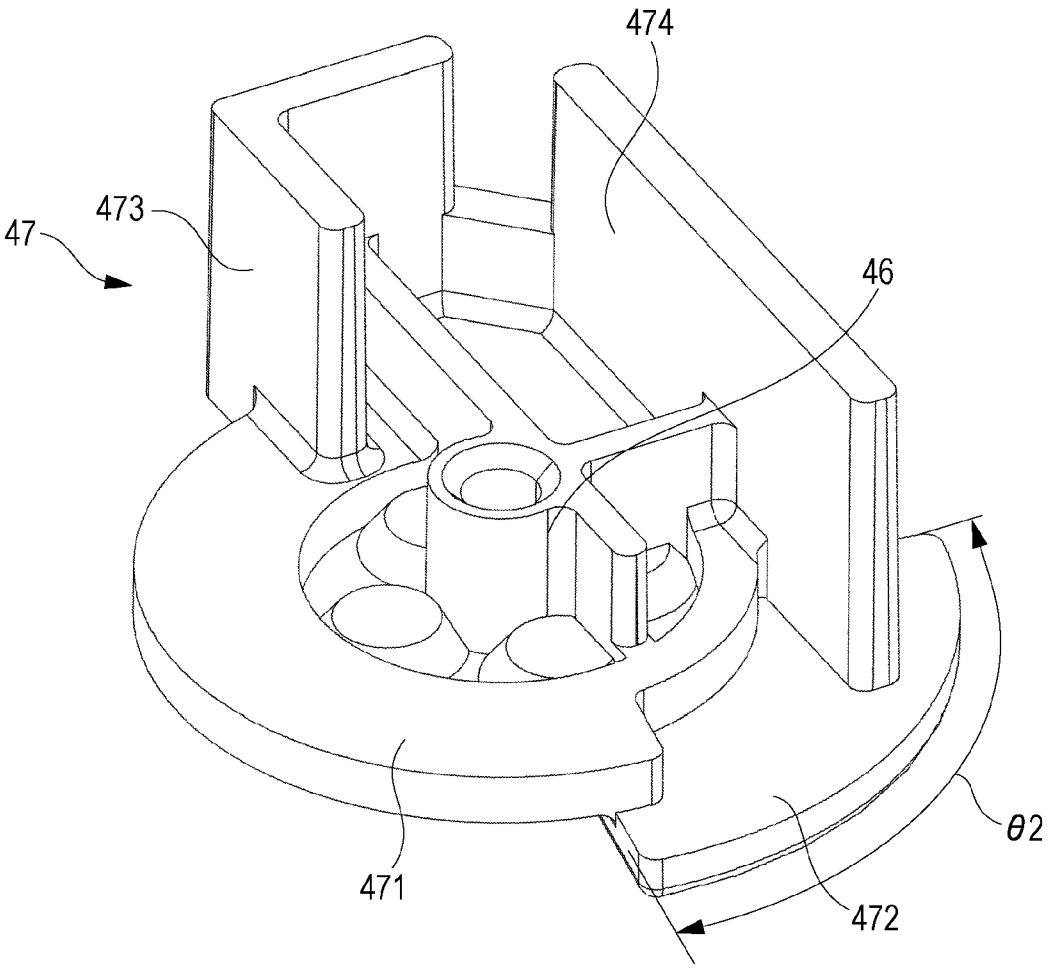


FIG. 12A

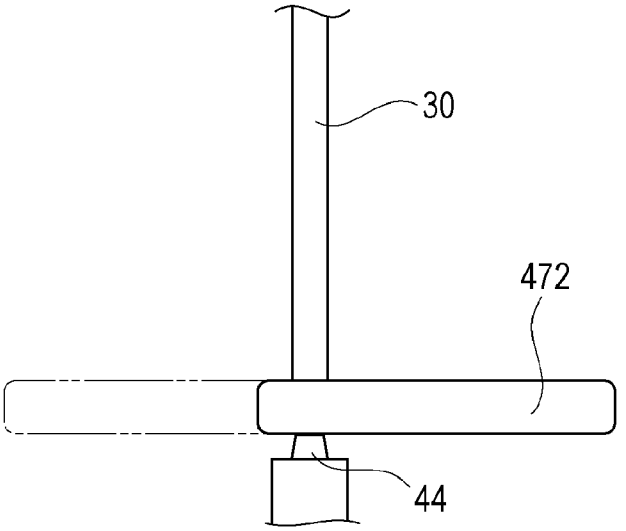


FIG. 12B

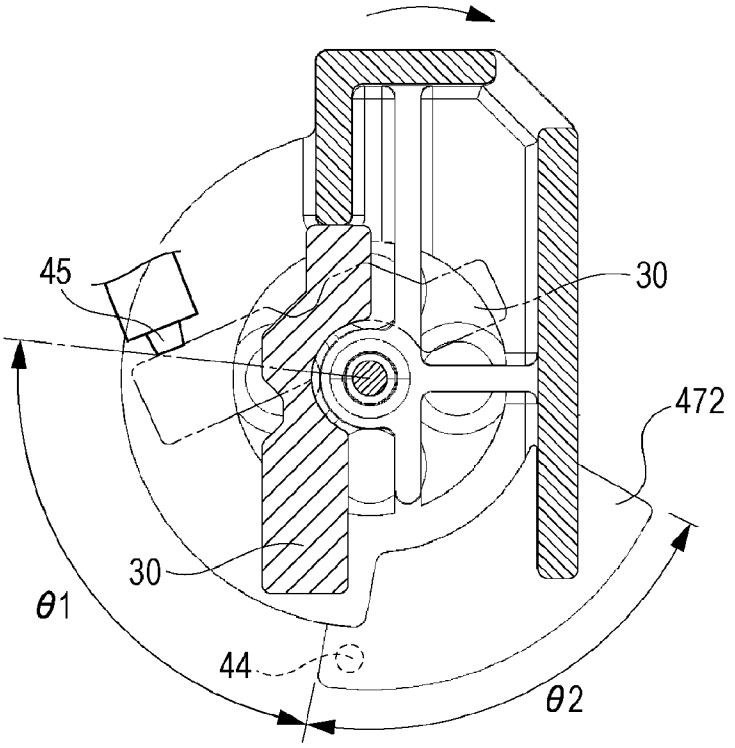
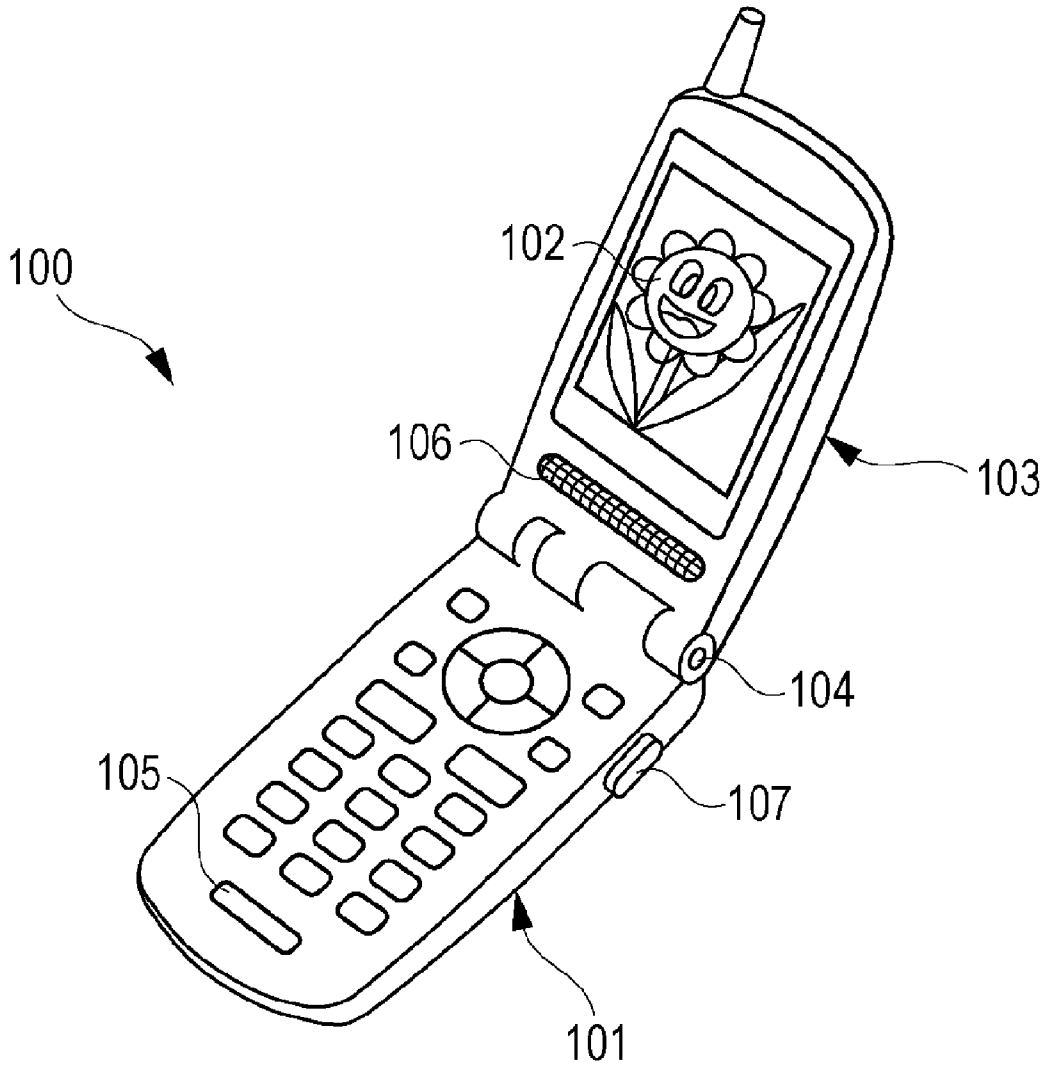


FIG. 13



OPERATING TOY

CROSS-REFERENCES TO RELATED APPLICATION

[0001] This application claims priority from Japanese Patent Application Serial No. 2010-268397 filed Dec. 1, 2010, the contents of which are incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to an operating toy.

[0004] 2. Description of the Related Art

[0005] Hitherto, a toy that emits sound and light (displays an image) has been known (Japanese Registered Utility Model No. 3108962). A toy cellular phone **100** described in Japanese Registered Utility Model No. 3108962 is, as shown in FIG. **13**, formed by connecting a phone main body **101** and a lid body **103** with a display portion **102** with a hinge portion **104** openably and closably. The phone main body **101** and the lid body **103** are provided with a sound sensor **105**, a speaker **106** for emitting sound, and a main switch **107**.

[0006] The toy cellular phone **100** has therein a control unit (not shown) that displays an appropriate image on the display portion **102** and outputs a preliminarily stored phrase from the speaker **106** for emitting sounds in response to the turning on of the main switch **107** or the sensing of sound by the sound sensor **105**. This control unit is configured to output an appropriate phrase when the sound sensor **105** detects that there is a break in the speaking voice of a user who is an infant.

[0007] Thus, the infant can perform speech play through pseudo-communication interestedly and pleasurably.

[0008] However, the above-described toy cellular phone **100** described in Japanese Registered Utility Model No. 3108962 does nothing other than operating in response to the voice of the user and is monotonous and dull.

SUMMARY OF THE INVENTION

[0009] Accordingly, an object of the present invention is to provide a more exciting operating toy.

[0010] In an aspect of the present invention, an operating toy includes a toy main body, a key cylinder attached to the toy main body, and a key member that can be inserted into the key cylinder. The key cylinder has a first switch that is turned on when the key member is inserted completely, and a plurality of second switches that are turned on at the timing when the first switch is turned off after the key member is rotated with the first switch turned on. The operating toy emits sound and light in a predetermined pattern according to the combination of the second switches turned on.

[0011] It is preferable that the key cylinder have an insertion hole into which the key member is inserted, and a rotating member that rotates with the rotation of the key member, that the first switch be located at the bottom of the insertion hole, and the plurality of second switches be arranged along the insertion hole, and that the key member have a first switch pressing portion at the distal end of an inserted portion inserted into the key cylinder, the first switch pressing portion turning on the first switch via the rotating member, and a second switch pressing portion on the side of the inserted portion, the second switch pressing portion turning on at least one of the plurality of second switches.

[0012] It is preferable that after the pressing of the first switch by the rotating member is released by the rotation of the key member, the second switches be pressed. It is preferable that the rotating member have a fan-shaped plate having a central angle smaller than the allowable rotation angle of the rotating member, and the first switch be pressed by the fan-shaped plate. It is preferable that the operating toy have a control portion that has a receiving portion receiving signals from the first switch and the second switches and that controls the operation of the operating toy, and the receiving portion start receiving signals from the second switches after the receiving portion receives the OFF signal of the first switch.

[0013] It is preferable that the key member have an inserted portion inserted into the key cylinder and a grip portion gripped by a user, and the grip portion serve as a doll body.

[0014] According to operating toy according to the present invention, a more exciting toy can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. **1** is an overall perspective view of an operating toy of an embodiment according to the present invention;

[0016] FIG. **2** is a perspective view of a toy main body after transformation;

[0017] FIG. **3** is an overall perspective view of a key;

[0018] FIG. **4** is an exploded perspective view of the key;

[0019] FIGS. **5**A, **5**B, and **5**C are front, side, and rear views of a doll body serving as a grip portion, with the lower body extended downward;

[0020] FIGS. **6**A, **6**B, and **6**C are front, side, and rear views of the doll body serving as a grip portion, with the lower body folded upward;

[0021] FIGS. **7**A and **7**B are front and bottom views of a key main body;

[0022] FIG. **8** is a perspective view of a key cylinder;

[0023] FIG. **9** is a block diagram showing a control system;

[0024] FIG. **10** is a sectional view taken along line X-X of FIG. **8**;

[0025] FIG. **11** is a perspective view of a rotating member as viewed from above;

[0026] FIG. **12**A is a side view showing the relationship between the key and a first switch, and FIG. **12**B is an explanatory diagram showing the rotation angle of the key and the relationship between the first switch and second switches; and

[0027] FIG. **13** is a perspective view of a conventional toy cellular phone.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] The embodiment of the present invention will now be described with reference to the drawings. As shown in FIG. **1**, an operating toy **10** in this embodiment has a toy cellular phone **20** serving as a toy main body, a key cylinder **40** attached to this toy cellular phone **20**, and a key member **30** that causes this key cylinder **40** to operate.

[0029] As shown also in FIG. **2**, the toy cellular phone **20** has a lower housing **22** having an input portion **21** including a plurality of dummy input keys **211**, and an upper housing **24** attached to the lower housing **22** with a hinge **23** openably and closably.

[0030] The key cylinder **40** is attached to a part of the lower housing **22** on the hinge **23** side of the input portion **21**. An insertion hole **41** into which the key member **30** is inserted is

exposed on the surface of the lower housing **22**. This key cylinder **40** is electrically connected to a control portion **50** that controls the operation of the toy main body. The control portion **50** is connected to a sound-emission control portion **51** that controls emission of sound, and a light emission control portion **52** that controls emission of light (see FIG. **9**). The control portion **50**, the sound-emission control portion **51**, the light emission control portion **52**, and the like can be housed, for example, in the lower housing **22**.

[0031] As shown in FIG. **2**, the upper housing **24** is transformable. For example, the upper housing **24** is divided into right and left halves and transforms into an X shape. In this case, a sword pattern **25** on the upper housing **24** may be provided with a light-emitting device so as to emit light. The lower housing **22** may also be provided with a light-emitting device **26**, for example, around the key cylinder **40**, and a speaker **27** emitting sound.

[0032] As shown in FIGS. **3** and **4**, the key member **30** has a key main body **31** serving as an inserted portion inserted into the key cylinder **40**, and a grip portion **32** gripped by a user. Here, the grip portion **32** is a doll body **33**. The doll body **33** has an upper body **34** and a lower body **35**. The lower body **35** is supported rotatably forward and backward relative to the upper body **34**. A key main body **31** is fixed to the upper body **34** so as to protrude downward. Arms **341**, **341** and a head **342** are rotatably attached to the upper body **34**.

[0033] As shown in FIGS. **3** and **5**A to **5**C, in a state where the lower body **35** extends downward relative to the upper body **34**, the key member **30** serves as the doll body **33** and can be transformed into various shapes by rotating both arms **341** and the head **342**. In this state, when viewed from the front, the key main body **31** is behind the lower body **35** and is not visible.

[0034] As shown in FIGS. **6**A to **6**C, when the lower body **35** is rotated upward so as to be superimposed onto the upper body **34**, the key main body **31** appears, and the upper body **34** and the lower body **35** superimposed thereon serve as the grip portion **32** of the key member **30**. When the key member **30** is inserted into the key cylinder **40**, as shown in FIGS. **6**A to **6**C, the lower body **35** is rotated upward.

[0035] As shown in FIGS. **7**A and **7**B, the key main body **31** has, in the upper part thereof, an attachment portion **311** to which the grip portion **32** is attached. The key main body **31** is provided with a groove **312** that is semicircular in cross-section and extends along the vertical direction. When the key main body **31** is inserted into the key cylinder **40** and is rotated, the groove **312** serves as the center of rotation.

[0036] The distal end face of the key main body **31** serves as a first switch pressing portion **314** that presses a first switch **44** (see FIG. **8**) of the key cylinder **40** in order to check that the key main body **31** is completely inserted into the insertion hole **41** of the key cylinder **40** described later. On the outer side of the key main body **31**, a plurality of protrusions **313** serving as second switch pressing portions are provided in various patterns. When the key member **30** is rotated, the protrusions **313** turn on second switches **45** (see FIG. **8**) of the key cylinder **40**.

[0037] Here, the number of the second switches **45** is six as described later, and therefore up to six protrusions **313** can be provided. Therefore, of the six protrusions **313**A, **313**B, **313**C, **313**D, **313**E, and **313**F, only the necessary protrusion or protrusions **313** are provided. Instead of the unnecessary protrusion or protrusions **313**, a space or spaces (a gap or gaps) are provided. In the case of the key member shown in FIGS. **7**A and **7**B, the protrusion **313**E is not provided.

[0038] As shown in FIG. **8**, the key cylinder **40** has a base portion **48** attached to the lower housing **22** of the toy cellular phone **20**, and a key cylinder main body **42** attached to the top of the base portion **48**. The key cylinder main body **42** has therein a rotating body **43** that is rotated by the key member **30**. The rotating body **43** is provided with an insertion hole **41** (see FIG. **2**) into which the key member **30** is inserted. Just under the insertion hole **41**, a shaft **46** is provided. Therefore, when the key member **30** is inserted into the insertion hole **41**, the shaft **46** fits into the groove **312** of the key member **30** and serves as the center of rotation. The protrusions **313** of the key member **30** protrude to the outside of the rotating body **43**.

[0039] Around the rotating body **43**, a plurality of second switches **45** are provided in the vertical direction. The second switches **45** are provided at positions rotated by an allowable rotation angle θ**1** from the insertion position of the key member **30** (see FIG. **12**B). Here, for example, six second switches **45** are provided. In order from the top, second switches **45**A, **45**B, **45**C, **45**D, **45**E, and **45**F are provided.

[0040] At the lower end of the shaft **46** and above the base portion **48**, a rotating member **47** is provided that is rotatable by a predetermined angle with the rotation of the key member **30**. Below the rotating member **47**, the first switch **44** is provided. As shown in FIGS. **10** and **11**, the rotating member **47** has a substantially semicircular upper plate **471** and a fan-shaped plate **472** provided below the upper plate **471**. Above the upper plate **471** and the fan-shaped plate **472**, a fitting portion into which the distal end (lower end) of the key member **30** is fitted is formed by a first vertical wall **473** and a second vertical wall **474**.

[0041] As shown in FIG. **12**B, the angle through which the key member **30** rotates after insertion before coming into contact with the second switches **45**, that is to say, the allowable rotation angle of the rotating member **47** is angle θ**1**. On the other hand, the central angle of the fan-shaped plate **472** is θ**2**, and the fan-shaped plate **472** can be in contact with the first switch **44** within this range.

[0042] Therefore, when the key member **30** is inserted and the first switch pressing portion **314** at the distal end of the key member **30** presses the rotating member **47**, the lower surface of the fan-shaped plate **472** presses and turns on the first switch **44**. When in this state, the key member **30** is rotated (in the direction of arrow in FIG. **12**B), the first switch **44** does not move, and therefore the fan-shaped plate **472** of the rotating member **47** slides while pressing the upper end face of the first switch **44**.

[0043] Here, the central angle θ**2** of the fan shape of the fan-shaped plate **472** is set smaller than the allowable rotation angle θ**1** of the fan-shaped plate **472**, that is to say, θ**1**>θ**2**. For this reason, when the fan-shaped plate **472** rotating with the key member **30** rotates by angle θ**2**, the fan-shaped plate **472** comes out of contact with the first switch **44**, and therefore the first switch **44** is turned off.

[0044] At this timing, the protrusions **313** of the key member **30** protruding from the rotating body **43** to the outside come into contact with the corresponding second switches **45** and turn on the second switches **45** (see FIG. **9**). Since here the protrusion **313**E (see FIG. **8**) is not provided, the second switch **45**E is not turned on.

[0045] In the operating toy of this embodiment, the first switch is pressed by the fan-shaped plate having a central angle smaller than the allowable rotation angle of the rotating

member, the fan-shaped plate comes out of contact with the first switch **44** with the rotation of the key member **30**, and the protrusions **313** of the key member **30** come into contact with the second switches at the timing when the first switch is turned off. That is to say, with the release of pressing of the first switch **44**, the second switches **45** are pressed, and therefore the second switches can be turned on with the key member **30** completely inserted in the insertion hole. Therefore, the protrusions **313** of the key member **30** can reliably press the corresponding second switches **45**, and false recognition of the second switches **45** can be avoided.

[0046] In this embodiment, as shown in FIG. **9**, the control portion **50** has a receiving portion **53**, a memory **54**, a determination portion **55**, a light emission control portion **52**, and a sound emission control portion **51**. The receiving portion **53** receives signals from the first switch **44** and the second switches **45** of the key cylinder **40**. The memory **54** stores patterns of sound output and light output corresponding to combinations of received signals. The determination portion **55** selects from among the output patterns stored in the memory **54** on the basis of the received signal from the receiving portion **53**. The light emission control portion **52** causes the light-emitting portions **25** and **26** to operate on the basis of the determination of the determination portion **55**. The sound emission control portion **51** causes the sound-emitting portion **27** to operate on the basis of the determination of the determination portion **55**. In this embodiment, after the OFF signal of the first switch **44** is received, reception of signals from the second switches **45** is started. Thus, deviation of the timing when the second switches **45** are turned on can be reduced. In addition, the false recognition of the second switches **45** can be prevented more reliably.

[0047] Next, the operation of the operating toy **10** will be described. In the case where the user uses the key member **30** as the doll body **33**, the lower body **35** is lowered (see FIGS. **5**A to **5**C). Since the arms **341** and the head **342** are movable, the user moves these.

[0048] In the case where the user uses the toy cellular phone **20**, the lower body **35** of the key member **30** is rotated so as to be superimposed onto the upper body **34**, and the key main body **31** is exposed (see FIGS. **6**A to **6**C). Next, the upper and lower housings **24** and **22** are opened, and the key main body **31** is inserted into the insertion hole **41** of the key cylinder **40**.

[0049] When the key member **30** has been inserted completely, the first switch pressing portion **314** at the distal end of the key member **30** turns on the first switch **44** of the key cylinder **40**, and the control portion **50** causes the light-emitting portions **25** and **26** and the sound-emitting portion **27** to operate and notifies the user that the key member **30** has been inserted completely (see FIG. **9**).

[0050] If it is checked that the key member **30** has been inserted completely, the key member **30** is rotated. At the timing when the first switch **44** is turned off, some of the second switches **45** are turned on. The protrusions **313** of the key member **30** turn on the corresponding second switches **45** of the key cylinder **40**. In the control portion **50**, the receiving portion **53** receives a key signal from the key cylinder **40**, the determination portion **55** selects an output pattern from the memory **54** on the basis of this signal, and the light emission control portion **52** and the sound emission control portion **51** cause the light-emitting portions **25** and **26** and the sound-emitting portion **27** to operate.

[0051] According to the operating toy **10** according to the above-described embodiment, when the key member **30** is inserted into the key cylinder **40** attached to the toy cellular phone **20** serving as a toy main body, and in the case where the key member **30** is inserted completely, the key member **30** turns on the first switch **44**, sound and light are output, and therefore it can be easily checked that the key member **30** is inserted completely. If in this state the key member **30** is rotated, some of the plurality of second switches **45** are turned on. According to the combination of second switches **45** turned on at this time, sound and light are emitted in a predetermined pattern, and therefore the user feels the satisfaction that sound and light are emitted by their operation. Since some of the second switches **45** are turned on at the timing when the first switch **44** is turned off, deviation of the timing when the second switches **45** are turned on can be reduced.

[0052] The key is rotated in a state where the key member **30** has turned on the first switch **44** and the key member **30** has been inserted completely, and the pressing of the second switches **45** is recognized at the timing when the first switch **44** is turned off. Therefore, the second switches **45** are pressed in a state where the key member **30** has been inserted completely. Therefore, false recognition of the selectively pressed second switches **45** can be avoided.

[0053] When the user grips the grip portion **32** of the key member **30** and inserts the key main body **31** of the key member **30** into the insertion hole **41** of the key cylinder **40**, and when the key member **30** is completely inserted, the first switch **44** is turned on by the first switch pressing portion **314** at the distal end of the key main body **31**. When the key member **30** is rotated, the second switches **45** are turned on by the protrusions **313** provided on the side of the key main body **31**.

[0054] Since the doll body **33** is provided in the grip portion **32** of the key member **30**, the user can use the key member **30** itself as a toy. In a state where the user grips the doll body **33** provided in the grip portion **32** of the key member **30**, operates the key member **30**, and inserts the key member **30** into the key cylinder **40**, only the doll body **33** stands on the toy cellular phone **20**. Therefore, the interest of the user can be attracted.

[0055] In addition, since the toy main body is a toy cellular phone **20**, the user can play only with the toy main body. In addition, by inserting and operating the key member **30**, various sounds are emitted from the toy cellular phone **20**. Therefore, the interest of the user can be attracted.

[0056] Although the preferred embodiment of the present invention has been described above, the operating toy **10** according to the present invention is not limited to the above-described embodiment, and various changes may be made therein without departing from the scope of the present invention described in claims. That is to say, in the above-described embodiment, a case where the toy main body is a toy cellular phone **20** is illustrated, but the present invention is not limited to this. The doll body **33** serving as the grip portion **32** of the key member **30** can be changed according to the situation.

What is claimed is:

1. An operating toy comprising:

a toy main body;

a key cylinder attached to the toy main body; and

a key member that can be inserted into the key cylinder,

wherein the key cylinder has a first switch that is turned on when the key member is inserted completely, and a plurality of second switches that are turned on at the timing when the first switch is turned off after the key member is rotated with the first switch turned on, and

wherein the operating toy emits sound and light in a predetermined pattern according to the combination of the second switches turned on.

2. The operating toy according to claim **1**, wherein the key cylinder has an insertion hole into which the key member is inserted, and a rotating member that rotates with the rotation of the key member, wherein the first switch is located at the bottom of the insertion hole, and the plurality of second switches are arranged along the insertion hole, and wherein the key member has a first switch pressing portion at the distal end of an inserted portion inserted into the key cylinder, the first switch pressing portion turning on the first switch via the rotating member, and a second switch pressing portion on the side of the inserted portion, the second switch pressing portion turning on at least one of the plurality of second switches.

3. The operating toy according to claim **2**, wherein after the pressing of the first switch by the rotating member is released by the rotation of the key member, the second switches are pressed.

4. The operating toy according to claim **2**, wherein the rotating member has a fan-shaped plate having a central angle smaller than the allowable rotation angle of the rotating member, and the first switch is pressed by the fan-shaped plate.

5. The operating toy according to claim **3**, wherein the rotating member has a fan-shaped plate having a central angle smaller than the allowable rotation angle of the rotating member, and the first switch is pressed by the fan-shaped plate.

6. The operating toy according to any one of claims **1** to **5**, wherein the operating toy has a control portion that has a receiving portion receiving signals from the first switch and the second switches and that controls the operation of the operating toy, and the receiving portion starts receiving signals from the second switches after the receiving portion receives the OFF signal of the first switch.

7. The operating toy according to any one of claims **1** to **5**, wherein the key member has an inserted portion inserted into the key cylinder and a grip portion gripped by a user, and the grip portion serves as a doll body.

8. The operating toy according to any one of claims **1** to **5**, wherein the toy main body serves as a toy cellular phone.

* * * * *