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REACTION TOY

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a reaction toy taking a predetermined operation according to a recognized sound, a generated air vibration or the like.

Description of Related Art

Conventionally, a reaction toy taking a predetermined operation according to a recognized sound is known.

As such a type of reaction toy, for example, Flower Rock (Trademark) or the like is known. The Flower Rock incorporating a sound sensor (a sound sensing member) for a sound (an external sound) and so on is a type of reaction toy having a shape of a plant doll and begins dancing when the sound sensed by the sound sensor has an audio-frequency band or a higher frequency band.

Further, another type of reaction toy is also known. For example, the toy incorporating a pressure sensor (a pressure sensing member) for sensing a pressure and so on is known. Such a type of reaction toy generates a sound by

a speaker contained in the toy on the basis of the sensed pressure by the pressure sensor when a specific portion of the toy body is brought into contact with a finger or the like, as disclosed in Japanese Patent Application Publication (Laid-open) No. Tokukai-hei 10-024173.

Another type of reaction toy as the above-described, which can take a predetermined operation when detecting not only an external sound but also a touch of a finger or the like to the toy and which gives more varied plays and a further large interest to children and so on, is also desired. In order to make the toy take a predetermined operation, generally, besides a sound sensor for sensing an external sound, another sensor, for example a pressure sensor, are provided at a predetermined position in an inside of the toy body. However, if some sensors are provided in the inside of the toy body, there has been some problems that such a provision of two sensors requires a higher production cost for the toy and a more complicated wiring for connection with each sensors and the like. Further, in order to make the toy take a predetermined operation by bringing into contact with any portion of the toy, it is necessary that a lot of pressure sensors and the like are provided at a lot of positions in the inside of the toy body, therefore the problems of the above-described has become larger.

SUMMARY OF THE INVENTION

The present invention was developed in view of the above-described problems.

An object of the present invention is to provide a more interesting reaction toy inexpensively which has a simple structure and can operate and take a predetermined operation when detecting not only an external sound but also a touch of a finger or the like to any portion of the covering body having an internal sound generating member.

In accordance with one aspect of the present invention, the reaction toy comprises: a toy body; a covering body at least one portion of which has a flexibility, for covering the toy body; an internal sound generating member for generating an internal sound by bringing any portion having the flexibility into contact with a finger or the like; a sound sensing member for sensing an external sound and the generated internal sound by the internal sound generating member to output a sound signal; a control member for controlling a predetermined operation on the basis of the outputted sound signal from the sound sensing member; and an operating member for taking the predetermined operation controlled by the

control member.

Further, the reaction toy comprises: a toy body; a covering body at least one portion of which has a flexibility, for covering the toy body; an internal sound generating member for generating an air vibration by bringing any portion having the flexibility into contact with a finger or the like; a vibration sensing member for sensing an external sound and the generated air vibration by the internal sound generating member to output a vibration signal; a control member for controlling a predetermined operation on the basis of the outputted vibration signal by the vibration sensing member; and a operating member for taking a predetermined operation controlled by the control member.

The internal sound means a generated sound by the internal sound generating member and the internal sound is different from an external sound. The generated air vibration by the internal sound generating member is different from another natural air vibration. Further, the generated internal sound and the generated air vibration by the internal sound generating member can be sensed by the sound sensing member or the vibration sensing member.

The internal sound generating member generates the internal sound or the air vibration by bringing any portion having the flexibility on the covering body into contact

with a finger or the like softly, for example stroking, or by bringing any portion into contact with a finger or the like strongly, for example pushing or striking. That is to say, the internal sound generating member can generate the internal sound or the air vibration by bringing any portion having the flexibility into contact with a finger or the like to the extent which can generate an internal sound or an air vibration possible to be sensed by the sound sensing member or the vibration sensing member.

According to the reaction toy having such a structure, when not only the external sound but also the internal sound or the air vibration are sensed by the sound sensing member or the vibration sensing member, the reaction toy can take a predetermined operation on the basis of the sensed external sound and the sensed internal sound or the sensed air vibration. Therefore, not only when a player talks to the reaction toy or claps hands, in other words when an external sound to be sensed by the sound sensing member is generated, but also when the player touches any portion having the flexibility of the covering body with a finger or the like from the outside, in other words when an internal sound or an air vibration to be sensed by the sound sensing member or the vibration sensing member is generated, the reaction toy can take a predetermined operation on the basis of the sensed sound by

the sound sensing member or the sensed vibration by the vibration sensing member, so that it is possible to provide a toy which gives more varied plays and a further large interest to children and the like.

Further, in accordance with the reaction toy having such a structure, the sound sensing member or the vibration sensing member can work as not only a sound sensor but also a conventional pressure sensor, substantially. Therefore, as compare with the case of containing both the sound sensor and the pressure sensor, it is possible to provide a toy which has a simpler structure, at lower cost.

Preferably, the operating member comprises: a plurality of driving parts for operating predetermined portions of the toy body individually; a driving member for driving at least one of the driving parts; and a driving part selecting member for selecting at least one of the driving parts to transfer a driving power from the driving member to the selected driving parts.

The driving part selecting member may comprise a selecting member for selecting the driving part at random.

According to the reaction toy having such a structure, the driving part selecting member selects at least one of the driving parts and any portion on the toy is moved by the selected driving part, therefore a player can enjoy more varied plays. Particularly, the selecting

member of the driving part selecting member selects the driving part at random, therefore it is possible to provide a toy which can give surprising plays and a further great interest to children and so on.

Preferably, the covering body is made of a material for generating an internal sound or an air vibration which can be sensed by the sound sensing member or the vibration sensing member, by bringing any portion having the flexibility into contact with a finger or the like from the outside.

According to the reaction toy having such a structure, when any portion having the flexibility on the covering body is brought into contact with a finger or the like from the outside, an internal sound or an air vibration to be sensed by the sound sensing member or the vibration sensing member can be generated.

The internal sound generating member for generating an internal sound or an air vibration by bringing any portion having the flexibility into contact with a finger or the like from the outside may be disposed in an inside of the covering body.

When bringing the portion having the flexibility into contact with a finger or the like from the outside, the internal sound generating member which is disposed in

the inside of the covering body can generate an internal sound or an air vibration to be sensed by the sound sensing member or the vibration sensing member.

The sound sensing member or the vibration sensing member may be disposed at a position at which the external sound and the generated internal sound or the generated air vibration by the internal sound generating member can be sensed.

Preferably, the control member controls the predetermined operation when the sensed sound by the sound sensing member has an audio-frequency band.

The control member may output a signal for generating a predetermined sound on the basis of the outputted sound signal by the sound sensing member.

The control member may also output a signal for moving a predetermined portion of the toy on the basis of the outputted sound signal by the sound sensing member.

The control member may also output a signal for emitting a predetermined light from a predetermined portion of the toy on the basis of the outputted sound signal by the sound sensing member.

The operating member comprising a sound output section for generating a predetermined sound, a driving mechanism section for moving a predetermined portion of the

toy, and a light emission section for emitting a predetermined light from a predetermined portion of the toy, may take these operations separately or a plurality of operations at the same time.

The control member may give a first function to the operating member only when the sound sensing member senses a sound with a first frequency band near the generated internal sound by the internal sound generating member, and the control member may give a second function different from the first function to the operating member when the sound sensing member senses another sound with a second frequency band apart from the generated internal sound by the internal sound generating member.

Preferably, the reaction toy has a shape selected from the group consisting of a personal doll, an animal doll, a plant doll, and an animated character doll.

According to the reaction toy having such a structure, when detecting not only the external sound but also the generated internal sound or the generated air vibration by the internal sound generating member, in other words when detecting a touch of a finger or the like to the portion having the flexibility on the covering body, the reaction toy can take a predetermined operation and a predetermined indication. Therefore, it is possible to provide a reaction toy which can give a great interest to

children and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understand from the detailed description given hereinafter and the accompanying drawing which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention, and wherein:

FIG. 1 is a perspective view showing an external structure of a figure toy as a reaction toy according to an embodiment of the present invention;

FIG. 2 is a vertical sectional view of the figure toy shown in FIG. 1, from the backside;

FIG. 3 is a vertical sectional view of the figure toy shown in FIG. 1, from a side;

FIG. 4 is a block diagram showing a main structure of the figure toy;

FIG. 5 is an exploded perspective view for explaining a main portion of the driving mechanism section;

FIGS. 6A and 6B are views for explaining a movement of the nose driving mechanism part;

FIG. 7 is a perspective view showing an external structure of the gear case containing the driving mechanism

section;

FIG. 8 is a perspective view showing an external structure of gear case having the ear shaft and the arm shaft, as shown in FIG. 7;

FIG. 9 is a view showing the first state for explaining a movement of the driving mechanism section;

FIG. 10 is a view showing the second state for explaining a movement of the driving mechanism section;

FIG. 11 is a view showing the third state for explaining a movement of the driving mechanism section;

FIG. 12 is a view showing the fourth state for explaining a movement of the driving mechanism section;

FIG. 13 is a view showing the fifth state for explaining a movement of the driving mechanism section;

FIG. 14 is a view showing the sixth state for explaining a movement of the driving mechanism section;

FIG. 15 is a view showing the seventh state for explaining a movement of the driving mechanism section;

FIG. 16 is a view showing the eighth state for explaining a movement of the driving mechanism section; and

FIG. 17 is a view showing the ninth state for explaining a movement of the driving mechanism section.

PREFERRED EMBODIMENT OF THE INVENTION

Hereinafter, an embodiment of the reaction toy according to the present invention will be explained with reference to the drawing, as follows.

FIG. 1 is a perspective view showing an external structure of a figure toy as a reaction toy according to the embodiment of the present invention. FIG. 2 is a vertical sectional view of the figure toy shown in FIG. 1, from the backside. FIG. 3 is a vertical sectional view of the figure toy shown in FIG. 1, from a side. FIG. 4 is a block diagram showing a main structure of the figure toy.

In accordance with the figure toy 1 as a reaction toy as shown in FIGS. 1 to 4, a toy body 2 has an external appearance such as an animal doll, a monster doll or the like.

A surface member 21 of the toy body 2 is made of a soft, flexible and thick synthetic resin film (for example, a vinyl chloride resin) as a covering body. When one portion of the surface member 21 is stroked or petted, pushed, or struck, by the finger or the like from the outside, the portion on the surface member 21 is vibrated or transformed or the like by a generated friction or the like to generate an internal sound such a fricative or another vibration sound or an air vibration which can be sensed by the sound sensing member or the vibration sensing member. Therefore, the surface member 21 works as an

internal sound generating member.

A containing part 22 is provided in the inside of the surface member 21. The containing part 22 of the toy body 2 comprises: a sound sensing section 3 as a sound sensing member or a vibration sensing member for sensing an external sound and an internal sound or an air vibration; a control section 4 as a control member for controlling a predetermined operation on the basis of a sensed sound by the sound sensing section 3; a sound output section 5 as a operating member to be controlled by the control section 4; a driving mechanism section 6 as an operating member for moving a nose, ears, and arms; a light emission section 7 as an operating member for emitting a light from a portion around a cheek; selector switches SW 1 and SW 2 for selecting two or three from the operating members of the sound output section 5, the driving mechanism section 6, and the light emission section 7; and a battery containing part 8 and so on.

The sound sensing section 3 as a sound sensing member or a vibration sensing member for sensing an external sound and an internal sound or an air vibration is composed of a condenser microphone 31, an amplifier circuit 32, and a judgment circuit 33.

The condenser microphone 31 is disposed, for example, in an inside of an opening portion 23 on a mouth of the toy

body 2. The condenser microphone 31 senses a sound (an external sound) from the outside and the generated internal sound or the generated air vibration by the surface member 21 on the toy body 2, thereafter outputs a sound signal or a vibration signal on the basis of the sensed sound or the sensed vibration. The amplifier circuit 32 amplifies the outputted sound signal or the outputted vibration signal by the condenser microphone 31, thereafter sends it to the judgment circuit 33. The judgment circuit 33 judges whether the amplified sound signal or the amplified vibration signal by the amplifier circuit 32 is a predetermined sound or vibration. The predetermined sound means, for example, a sound having an audio-frequency band and can be determined according to the situation.

The control section 4 as a control member controls an operation on the basis of inputs of an outputted judgment signal by the judgment circuit 33 and an outputted SW signal by the selector switch SW 1 or SW 2.

For example, when the selector switch (SW 1) is turned on and outputs a SW 1 signal, the SW 1 signal is inputted into the control section 4. In this state, when the judgement signal is inputted into the control section 4, the control section 4 outputs a sound output signal to the sound output section 5, a movement signal to the driving mechanism section 6, and a light emission signal to the

light emission section 7, respectively.

Further, for example, when the selector switch (SW 2) is turned on and outputs a SW 2 signal, the SW 2 signal is inputted into the control section 4. In this state, when the judgement signal is inputted into the control section 4, the control section 4 outputs a sound output signal to the sound output section 5 and a light emission signal to the light emission section 7, respectively. At this time, the control section 4 does not output a movement signal to the driving mechanism section 6.

The selector switch SW 1 outputs a SW 1 signal to the control section 4 for controlling the sound output, the movement of a nose, ears, and arms, and the light emission on the cheek. The selector switch SW 2 outputs a SW 2 signal to the control section 4 for controlling the sound output and the light emission on the cheek.

The sound output section 5 as an operating member further comprises a sound synthesizing circuit, a D/A converter, an amplifier circuit, a speaker 51 and so on, which are not shown in figures. The sound synthesizing circuit selects a predetermined sound data from some kinds of sound data which is contained in the sound synthesizing circuit, on the basis of the outputted sound output signal by the control section 4, thereafter outputs the

predetermined sound data to the D/A converter. The D/A converter converts the outputted predetermined sound data by the sound synthesizing circuit into an analogue signal. The amplifier circuit amplifies the sound data which is converted into the analogue signal by the D/A converter. Thereafter a predetermined sound is outputted from the speaker 51, for example, which is arranged in an inside of hips or the like of the toy body 2.

The driving mechanism section 6 as an operating member comprises a driving part 61 which is arranged in an inside of a gear case 60 of the containing part 22, as a driving member, a nose driving mechanism part 62 for moving a nose 24 on the toy body 2 on the basis of the driving power by the driving part 61, an ear driver part 63 for moving ears 25 on the toy body 2 on the basis of the driving power by the driving part 61, an arm driver part 64 for moving arms 26 on the toy body 2 on the basis of the driving power by the driving part 61, and a driving part selecting member 65 for selecting one from the nose driving mechanism part 62, the ear driver part 63, and the arm driver part 64.

The driving mechanism section 6 will be explained with a reference to FIG. 5 to FIG. 8.

The driving part 61 comprises a motor 61a, a driving power transmission shaft 61b, a motor shaft 61c, a small

pulley 61d, a spur gear 61e, a large pulley 61f, and a rubber belt 61g, as shown in FIG. 5.

The motor 61a is connected with a contained battery 81 into a battery containing part 8 and can rotate forward or rotate backward on the basis of the outputted control signal by the control section 4.

The driving power transmission shaft 61b transfers a driving power from the motor 61a to the spur gear 61e.

The small pulley 61d is fixed at an opposite end position against the motor 61a on the motor shaft 61c.

The spur gear 61e is fixed at one end position on the driving power transmission shaft 61b and the large pulley 61f is fixed at the other end position on the driving power transmission shaft 61b.

The small pulley 61d is connected with the large pulley 61f through the rubber belt 61g, therefore the driving power by the motor 61a is transferred to the driving power transmission shaft 61b and to the spur gear 61e.

The driving part selecting member 65 comprises a movable gear shaft 65a, a movable large gear 65b, a movable small gear 65c, a movable gear base 65e having a rib 65d, a movable gear small shaft 65f, and a planet gear 65g.

The movable large gear 65b which gears into the spur gear 61e, the movable small gear 65c which is fixed at the

movable large gear 65b, and the movable gear base 65e having the rib 65d are arranged at the movable gear shaft 65a.

The movable gear small shaft 65f is fixed at the movable gear base 65e. The planet gear 65g is arranged at the movable gear small shaft 65f and gears into the movable small gear 65c.

The movable large gear 65b is rotated by the transferred driving power which is driven by the motor 61a, through the spur gear 61e, thereby the planet gear 65g is rotated along a circumference of the movable small gear 65c according to a direction of this rotation.

The planet gear 65g which is connected with the movable gear small shaft 65f is controlled the rotation thereof by a stopper 60a. The stopper 60a which is shown in FIG. 9, is provided at the gear case 60 and can bring into contact with the rib 65d of the movable gear base 65e.

The nose driving mechanism part 62 comprises a nose driver shaft 62a, a gear with a nose cam 62b providing a nose cam 62i, a nose crank 62c providing a rib 62d, a nose interlocking plate 62e providing a protruding portion 62f, a pointed portion 62g, a pulling spring 62h, a nose interlocking lever 62j, a shaft 62k, a pulling spring 62l, a nose cam contact part 62m, and a movable gear base engaging part 62n.

The gear with a nose cam 62b which can gear into the planet gear 65g is provided at one end position on the nose driver shaft 62a and the nose crank 62c is provided at the other end position thereof.

The rib 62d which is provided at the nose crank 62c can bring into contact with the protruding portion 62f which is provided at the nose interlocking plate 62e.

The pointed portion 62g of the nose interlocking lever 62j is connected with the nose 24 of the toy body 2. One end portion of the pulling spring 62h which is fixed at an inside of the gear case 60 is fixed at the nose interlocking plate 62e.

When the nose crank 62c is rotated, the rib 62d of the nose crank 62c strikes against the protruding portion 62f of the nose interlocking plate 62e, as shown in FIG. 6. Thereby the pulling spring 62h expands or contracts and the nose interlocking plate 62e is moved forward or backward. Therefore, the nose is looked like twitching from the outside.

The nose interlocking lever 62j is provided at the inside of the gear case 60 and works as a selecting member of the driver part selecting member 65. The nose interlocking lever 62j comprises the nose cam contact part 62m and the movable gear base engaging part 62n.

An upper end portion of the nose cam contact part 62m is supported as rotatable from the shaft 62k and a

lower end portion thereof is connected with the pulling spring 62l.

The movable gear base engaging 62n interlocks with the nose cam contact part 62m.

When the nose cam 62i of the gear with the nose cam 62b is rotated the movable gear base engaging part 62n is rotated on the shaft 62k. Thereby the movable gear base engaging part 62n engages the rib 65d of the movable gear base 65e or makes it go through, according to the rotation of the nose cam 62i.

The ear driver part 63 comprises an ear driver shaft 63a, an ear clutch gear 63b, ear cranks 63c and 63c, a pin 63d, an ear rod 63e having a groove part 63f, and an ear shaft 63g.

The ear clutch gear 63b which can gear into the planet gear 65g is provided at the ear driver shaft 63a. The ear cranks 63c are arranged at both end positions of the ear driver shaft 63a.

The pin 63d is fixed at the each ear crank 63c and can slide on the groove part 63f of the ear rod 63e, as shown in FIG. 7.

The ear shaft 63g is provided at a pointed position of the ear rod 63e, as shown in FIG. 8.

When the planet gear 65g gears into the ear clutch gear 63b, the ear crank 63c is rotated. Thereby the ear

rod 63e is swung and the ear shaft 63g is also swung. Therefore, the ears are looked like moving with a patter from the outside.

The arm driver part 64 comprises an arm driver shaft 64a, an arm clutch gear 64b, an arm crank 64c, a pin 64d, an arm rod 64e having a groove part 64f, and an arm shaft 64g.

The arm clutch gear 64b which can gear into the planet gear 65g is provided at the arm driver shaft 64a. The arm cranks 64c are arranged at a right end position and a left end position of the arm driver shaft 64a.

The pin 64d is fixed at the each arm crank 64c and can side on the groove part 64f of the arm rod 64e.

The arm shaft 64g is provided at a pointed position of the arm rod 64e.

When the planet gear 65g gears into the arm clutch gear 64b, the arm crank 64c is rotated. Thereby the arm rod 64e is swung and the arm shaft 64g is also swung. Therefore, the arms are looked like moving with a patter from the outside.

Hereafter, a driving part selecting by the driving part selecting member 65 will be explained with reference with FIG. 9 to FIG. 17.

The motor 61a is rotated forward in order to make

the spur gear 61e of the driving power transmission shaft 61b rotate clockwise, as shown in FIG. 9. Thereby the movable large gear 65b and the movable gear base 65e are rotated counterclockwise and the movable gear base 65e is brought into contact with a lower end portion of a stopper 60a. When the planet gear 65g gears into the gear with the nose cam 62b, the nose driver shaft 62a is rotated. Thereby the nose crank 62c is rotated and the nose interlocking plate 62e is moved forward or backward.

Thereafter, the motor 61a is rotated backward from this state, thereby the spur gear 61e of the driving power transmission shaft 61b is rotated counterclockwise, as shown in FIG. 10. Thereby the movable large gear 65b and the movable gear base 65e are rotated clockwise. At this time, when the rib 65d of the movable gear base 65e does not strike against a movable gear base engaging part 62n of a nose interlocking lever 62j, the planet gear 65g goes through without gearing into the ear clutch gear 63b. Thereafter the planet gear 65g gears into the gear pawl 60b which is provided in an inside of the gear case 60 once and a movement speed of the planet gear 65g becomes faster, as shown in FIG. 11. When the rib 65d of the movable gear base 65e is brought into contact with an upper end portion of the stopper 60a, as shown in FIG. 12, the planet gear 65g gears into the arm clutch gear 64b and the arm driver shaft 64a is rotated. Thereby the arm crank 64c is rotated

and the arm shaft 64g is swung through the arm rod 64e.

The motor 61a is again rotated forward from this state, thereby the spur gear 61e of the driving power transmission shaft 61b is rotated clockwise, as shown in FIG. 13. Thereby, when the movable large gear 65b and the movable gear base 65e are rotated counterclockwise, the movable gear base 65e is separated from the stopper 60a and the planet gear 65g is rotated counterclockwise, as shown in FIG. 14. At this time, the planet gear 65g gears into the gear pawl 60b once and the movement speed of the planet gear 65g becomes faster. When the rib 65d of the movable gear base 65e is brought into contact with a lower end portion of the stopper 60a, the planet gear 65g gears into the gear with the nose cam 62b and the nose driver shaft 62a is rotated, as shown in FIG. 15. Thereby the nose crank 62c is rotated and the nose interlocking plate 62e is moved forward or backward.

Thereafter, the motor 61a is again rotated backward from this state, thereby the spur gear 61e of the driving power transmission shaft 61b is again rotated counterclockwise, as shown in FIG. 16. Thereby the movable large gear 65b and the movable gear base 65e are rotated clockwise. At this time, when the rib 65d of the movable gear base 65e strikes against the movable gear base engaging part 62n of the nose interlocking lever 62j as

shown in FIG. 17, the planet gear 65g gears into the ear clutch gear 63b and the ear driver shaft 63a is rotated. Thereby the ear crank 63c is rotated and the ear driver shaft 63a is swung through an ear rod 63e.

That is to say, when the motor 61a is rotated forward the nose interlocking plate 62e is usually worked and the nose 2 is moved, and when the motor 61a is rotated backward the ears 25 are moved or arms 26 are moved according to the position of the movable gear base engaging part 62n of the nose interlocking lever 62j.

The light emission section 7 is composed of a LED 71 (Light Emitting Diode) and so on, which are not shown in figures.. For example, the light emission section 7 is provided in an inside of the cheek on the toy body 2 and emits a light on the basis of a outputted light emission signal by the control section 4.

According to the figure toy 1 comprising a construction of the above-described, various plays can be carried out, as follows.

That is, after putting a battery 81 into the battery containing part 8, the SW 1 is turned on, thereby the SW 1 signal is outputted to the control section 4. In this state, when a player talks to the figure toy 1 or brings

into contact with the figure toy 1, the sound (the external sound and the internal sound or the air vibration) is sensed by the condenser microphone 31 and amplified by the amplifier circuit 32, thereafter the sound is judged by the judgment circuit 33. When the sound has been judged to be a sound having an audio-frequency band by the judgment circuit 33, a judgement signal is outputted to the control section 4. However, when the sound is too small, the judgment signal is not outputted to the control section 4.

Thereafter, by the inputs of the judgment signal and the SW 1 signal, the control section 4 outputs a sound output signal for speaking a predetermined sound to the sound output section 5, a light emission signal for emitting a predetermined light from a predetermined portion on the figure body 1 to the light emission section 7, and a movement signal for moving a predetermined portion of the figure toy 1 to the driving mechanism section 6.

By the inputs of the judgment signal and the SW 1 signal, the sound output signal is outputted to the sound output section 5 by the control section 4, thereby a selected predetermined sound, for example 'Good morning', from some kinds of sound data is generated by a speaker 51.

Further, at the same time, by the inputs of the judgment signal and the SW 1 signal, the light emission

signal is outputted to the light emission section 7 by the control section 4, thereby a LED 71... which is contained in an inside around a cheek portion on the toy body 2 emits a predetermined light.

Thereafter, by the inputs of the judgment signal and the SW 1 signal, the movement signal is outputted to the motor 61a of the driving mechanism section 6 by the control section 4. The movement signal is that by which the motor 61a is rotated forward for a determined time, thereafter the motor 61a is rotated backward for a determined time from it. Thereby the motor 61a is rotated forward for a determined time on the basis of the outputted movement signal by the control section 4.

The motor 61a is rotated forward, thereby the spur gear 61e is rotated clockwise. Thereby the movable large gear 65b and the movable gear base 65e are rotated counterclockwise. Thereby the movable gear base 65e is brought into contact with the lower end portion of the stopper 60a. When the planet gear 65g gears into the gear with a nose cam 62b, the nose driver shaft 62a is rotated. Thereby the nose crank 62c is rotated and the nose interlocking plate 62e is moved forward or backward, therefore the nose is looked like twitching from the outside.

After the motor 61a has been rotated forward for the

determined time, the motor 61a is rotated backward, thereby the spur gear 61e is rotated counterclockwise. Thereby the movable large gear 65b and the movable gear base 65e are rotated clockwise.

When the rib 65d of the movable gear base 65e does not strike against the movable gear base engaging part 62n of the nose interlocking lever 62j, the planet gear 65g goes through without gearing into the ear clutch gear 63b, thereafter the rib 65d of the movable gear base 65e is brought into contact with an upper end portion of the stopper 60a. When the planet gear 65g gears into the arm clutch gear 64b, the arm driver shaft 64a is rotated. Thereby the arm crank 64c is rotated and the arm shaft 64g is swung through the arm rod 64e, therefore the arms are looked like moving with a patten from the outside.

In the other side, when the rib 65d of the movable gear base 65e strikes against the movable gear base engaging part 62n of the nose interlocking lever 62j, the planet gear 65g gears into the ear clutch gear 63b, thereafter the ear driver shaft 63a is rotated. Thereby the ear crank 63c is rotated and the ear driver shaft 63a is swung through the ear rod 63e, therefore the ears are looked like moving with a patten from the outside.

Further, the SW 2 is turned on, thereby the SW 2 signal is outputted to the control section 4. In this

state, when a player talks to the figure toy 1 or brings into contact with the figure toy 1, the sound (the external sound and the internal sound or the air vibration) is sensed by the condenser microphone 31 and amplified by the amplifier circuit 32, thereafter the sound is judged by the judgment circuit 33. When the sound has been judged to be a sound having an audio-frequency band by the judgment circuit 33, a judgment signal is outputted to the control section 4. However, when the sound is too small, the judgment signal is not outputted to the control section 4.

Thereafter, by the inputs of the judgment signal and the SW 2 signal, the control section 4 outputs a sound output signal for speaking a predetermined sound to the sound output section 5, and a light emission signal for emitting a predetermined light from a predetermined portion on the figure toy to the light emission section 7.

By the inputs of the judgment signal and the SW 2 signal, the sound output signal is outputted to the sound output section 5 by the control section 4, thereby a selected determined sound, for example 'Hello', from some kinds of sound data is generated by the speaker 51.

Further, at the same time, by the inputs of the judgment signal and the SW 1 signal, the light emission signal is outputted to the light emission section 7 by the control section 4, thereby the LED 71... which is contained

in the inside around the cheek portion on the toy body 2 emits a predetermined light.

In the state the SW 2 has been turned on, the control section 4 does not output a movement signal for moving a predetermined portion of the figure toy 1 to the driving mechanism section 6, so that the motor 61a is not rotated. Therefore, the nose driving mechanism part 62, the ear driver part 63, and the arm driver part 64 are not worked.

According to the figure toy 1 of the present invention as the above-described, when the sound sensing section 3 senses not only an external sound but also an internal sound or an air vibration, the figure toy 1 takes a predetermined operation and indication. Therefore, not only when a player talks to the figure toy 1 or claps hands to generate an external sound but also when a player touches or pushes by a finger or the like, to the surface member 21 of the toy body 2 to generate an internal sound or an air vibration, the figure toy 1 can take a predetermined operation and indication. As a result, it is possible to provide a toy which can give varied plays and a further large interest to children and the like.

Further, the sound sensing member can work as not only a sound sensor but also a conventional pressure sensor, substantially. Therefore, as compare with containing both

the sound sensor and the pressure sensor, it is possible to provide a toy which has a simpler structure, at lower cost.

Further, any portion of the toy body 2 is driven by the selected driver parts of the driving mechanism section 6 by the driving part selecting member 65, therefore a player can enjoy more varied plays. Particularly, according to the movement of the nose interlocking lever 62j, a select of the ear driver part 63 or the arm driver part 64 is at random, so that it is possible to provide a toy which can give surprising plays and a further large interest to children and the like.

Although the present invention has been explained according to the above-described embodiment, it should also be understood that the present invention is not limited to the embodiment as the above-described and various changes and modifications may be made to the invention without departing from the gist thereof.

For example, although the figure toy 1 has a shape of an animal or monster doll in the above-described embodiment, the figure toy 1 may also have a shape of a person doll, a plant doll, or an animated character doll.

In the above-described embodiment, although the surface member 21 of the toy body 2, that is the internal sound generating member, is made of a soft, flexible, and thick synthetic resin (for example, a vinyl chloride resin)

film or sheet, the internal sound generating member may be made of a hard plastic, a metal, or a rubber, which can generate an internal sound or an air vibration possible to be sensed by the sound sensing member or the vibration sensing member, by bringing the internal sound generating member into contact with a finger or the like from the outside.

Further, although the surface member 21 works as the internal sound generating member, the internal sound generating member may be disposed in an inside of the surface member 21.

Although the condenser microphone 31, that is a sound sensing member, is disposed at around the opening portion 23; the sound sensing member may be disposed at a position possible to sense the external sound and the generated internal sound or the generated air vibration by the internal sound generating member.

Although the judgment circuit 33 judges whether the sensed sound by the sound sensing member has an audio-frequency band, the judgement circuit 33 may judge the sensed sound on the basis of a frequency band other than the audio-frequency band.

Although the selecting member of the driving part selecting member 65 is a type of mechanical part, the selecting member may be another type of part which is controlled by an electricity, such a micro chip or the like.

The control member may give a first function to the operating member only when the sound sensing member senses a sound with a first frequency band near the generated internal sound by the internal sound generating member, and the control member may give a second function different from the first function to the operating member when the sound sensing member senses another sound with a second frequency band apart from the generated internal sound by the internal sound generating member. According to the figure toy 1 having such a construction, the action of the figure toy 1 when being talked to a child or the like can be made to be different from the action of the figure toy 1 when being touched. As a result, it is possible to provide a toy which can give a further large interest to children and the like.

According to the present invention, effects will be explained, as follows.

When the sound sensing member senses not only a external sound but also an internal sound or an air vibration, the reaction toy can take a predetermined operation. Therefore, when a player not only talks to the reaction toy or claps hands to generate an external sound but also touches or pushes by the finger or the like, to the reaction toy to generate an internal sound or an air vibration, the reaction toy can take a predetermined

operation and a predetermined indication. As a result it is possible to provide a toy which can give varied plays or a further large interest to children and the like.

Further, the sound sensing member can work as not only a sound sensor but also a conventional pressure sensor, substantially. Therefore, as compare with containing both the sound sensor and the pressure sensor, it is possible to provide a toy which has a simpler structure, at lower cost.

Further, any portion of the toy body is driven by at least one selected driver part by the driving part selecting member, therefore a player can enjoy more varied plays. Particularly, a selecting member selects a driving part at random, so that it is possible to provide a toy which can give surprising plays and a further large interest to children and the like.



What is claimed is:

1. A reaction toy comprising:

a toy body;

a covering body at least one portion of which has a flexibility, for covering the toy body;

an internal sound generating member for generating an internal sound by bringing any portion having the flexibility into contact with a finger or the like;

a sound sensing member for sensing an external sound and the generated internal sound by the internal sound generating member, to output a sound signal;

a control member for controlling a predetermined operation on the basis of the outputted sound signal from the sound sensing member; and

an operating member for taking the predetermined operation controlled by the control member.

2. A reaction toy comprising:

a toy body;

a covering body at least one portion of which has a flexibility, for covering the toy body;

an internal sound generating member for generating an air vibration by bringing any portion having the flexibility into contact with a finger or the like;

a vibration sensing member for sensing an external sound and the generated air vibration by the internal sound



generating member, to output a vibration signal;

a control member for controlling a predetermined operation on the basis of the outputted vibration signal by the vibration sensing member; and

an operating member for taking the predetermined operation controlled by the control member.

3. The reaction toy as claimed in any one of claims 1 to 2, wherein the operating member comprises:

a plurality of driving parts for operating predetermined portions of the toy body individually;

a driving member for driving at least one of the driving parts; and

a driving part selecting member for selecting at least one of driving parts to transfer a driving power from the driving member to the selected driving part.

4. The reaction toy as claimed in claim 3: wherein the driving part selecting member comprises a selecting member for selecting the driving part at random.

5. The reaction toy as claimed in any one of claims 1 to 2: wherein the covering body is made of a material for generating an internal sound or an air vibration which can be sensed by the sound sensing member or the vibration sensing member, by bringing any portion



having the flexibility into contact with a finger or the like from the outside.

6. The reaction toy as claimed in any one of claims 1 to 2: wherein the internal sound generating member for generating an internal sound or an air vibration by bringing any portion having the flexibility into contact with a finger or the like from the outside is disposed in an inside of the covering body.

7. The reaction toy as claimed in any one of claims 1 to 2: wherein the sound sensing member or the vibration sensing member is disposed at a position at which the external sound and the generated internal sound or the generated air vibration by the internal sound generating member can be sensed.

8. The reaction toy as claimed in any one of claims 1 to 2: wherein the control member controls the predetermined operation when the sensed sound by the sound sensing member has an audio-frequency band.

9. The reaction toy as claimed in any one of claims 1 to 2: wherein the control member outputs a signal for generating a predetermined sound on the basis of the outputted sound signal by the sound sensing member.



10. The reaction toy as claimed in any one of claims 1 to 2: wherein the control member outputs a signal for moving a predetermined portion of the toy on the basis of the outputted sound signal by the sound sensing member.

11. The reaction toy as claimed in any one of claims 1 to 2: wherein the control member outputs a signal for emitting a predetermined light from a predetermined portion of the toy on the basis of the outputted sound signal by the sound sensing member.

12. The reaction toy as claimed in any one of claims 1 to 2: wherein the operating member comprising a sound output section for generating a predetermined sound, a driving mechanism section for moving a predetermined portion of the toy, and a light emission section for emitting a predetermined light from a predetermined portion of the toy, takes these operations separately or a plurality of operations at the same time.

13. The reaction toy as claimed in any one of claims 1 to 2: wherein the control member gives a first function to the operating member only when the sound sensing member senses a sound with a first frequency band near the generated internal sound by the internal sound



generating member, and the control member gives a second function different from the first function to the operating member when the sound sensing member senses another sound with a second frequency band apart from the generated internal sound by the internal sound generating member.

14. The reaction toy as claimed in any one of claims 1 to 2: wherein the reaction toy has a shape selected from the group consisting of a personal doll, an animal doll, a plant doll, and an animated character doll.