

CONTROL DEVICE, CONTROL METHOD AND TOY USING THE CONTROL
DEVICE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a control device and a control method, for controlling a function of a predetermined circuit member on the basis of a sensed sound by a sound sensing member, and a figure toy using the control device or a control method.

Description of Related Art

Conventionally, such a type of control device is incorporated, for example, in Flower Rock (a trade mark) or the like. The Flower Rock incorporating the control device having a sound sensor (a sound sensing member) for sensing a sound (an external sound) and so on, is a type of figure toy having a shape of a plant doll and begins dancing when the sensed sound by the sound sensor has an audio-frequency or a higher frequency.

Further, a toy incorporating another type of control device is known. For example, the toy incorporating a control device having a pressure sensor (a pressure sensing

member) for sensing a pressure is known. Such a type of 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 Publication (Laid-open) No. Tokukai-hei 10-024173.

Another type of toy incorporating a control device, which takes a predetermined action when the control device detects not only an external sound but a touch of a finger or the like to the toy, is also desired. In order to make the toy take a predetermined action, generally, besides a sound sensor for sensing the 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 were 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 action and the like 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 toy body, therefore the tendency of the above-described problem becomes 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 control device which has a simple structure and can operate not only when sensing an external sound but when sensing a touch of a finger or the like to any portion of the covering body having an internal sound generating member.

Another object of the present invention is to provide a figure toy which has a simple structure and can operate not only when sensing an external sound but when sensing a touch of a finger or the like to any portion of the covering body having an internal sound generating member.

A further object of the present invention is to provide a control method which can control a function of a predetermined circuit simply on the basis of sensing an external sound and a touch of a finger or the like.

In accordance with one aspect of the present invention, the control device comprises; a covering body for covering a control section; an internal sound generating member for generating an internal sound by

bringing the covering body 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

Further, the control device comprises; a covering body at least one portion of which has a flexibility, for covering a control section; 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

The internal sound means a generated sound by the internal sound generating member of the control device. The internal sound is a sound possible to be sensed by the sound sensing member and different from the external sound.

The internal sound generating member generates the internal sound by bringing any portion having the flexibility, of the covering body into contact with a

finger or the like softly, for example stroking, or by bringing the 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 by bringing any portion having the flexibility into contact with a finger or the like to the extent which can generate a sound possible to be sensed by the sound sensing member.

According to the control device having such a structure, not only in case of having sensed the external sound by the sound sensing member but also in case of having generated the internal sound by the internal sound generating member, in other words in case of having brought any portion having the flexibility into contact with a finger or the like, it is possible for the control section of the control device to control a predetermined circuit member on the basis of a outputted sound signal by the sound sensing member.

Further, in accordance with the control device having such a structure, one sound sensing member can work as not only a sound sensor but also such a pressure sensor, substantially. Therefore, as compared with the case of containing both the sound sensor and the pressure sensor, it is possible to be simplify the structure of the control device.

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

According to the control device 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 to be sensed can be generated.

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

The sound sensing member may be arranged anywhere at which the external sound and the generated internal sound by the internal sound generating member can be sensed.

The control section preferably controls the

function of the predetermined circuit member when the sound to be sensed by the sound sensing member has an audio-frequency band.

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

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

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

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

The control section may control the function of the predetermined circuit member when the sensed sound signal by the sound sensing member has a frequency over the audio-frequency band.

In accordance with another aspect of the present

invention, the figure toy including a control device which comprises: a covering body for covering a control section; an internal sound generating member for generating an internal sound by bringing the covering body 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

The figure toy including a control device which may comprise: a covering body at least one portion of which has a flexibility, for covering a control section; 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

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

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

In accordance with the figure toy having such a structure, by sensing not only the external sound but also the generated internal sound by the internal sound generating member, in other words by bringing any portion having the flexibility on the covering body into contact with a finger or the like from the outside, it is possible for the figure toy to move and indicate as predetermined. Therefore, it is possible to provide a toy which can give a great interest to children and the like.

In accordance with a further aspect of the present invention, the control method comprising the steps of: generating an internal sound by bringing a covering body into contact with a finger or the like, sensing an external sound and the generated internal sound to output a sound

signal, and controlling a function of a predetermined circuit member on the basis of the outputted sound signal.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinafter and the accompanying drawings 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 incorporating the control device according to an embodiment of the present invention; and

FIG. 2 is a block diagram showing an internal structure of the figure toy incorporating the control device shown in FIG.1.

PREFERRED EMBODIMENT OF THE INVENTION

Hereinafter, an embodiment of the control device 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 incorporating the control device of the present invention. FIG.2 is a block diagram showing an internal circuit structure of the figure toy as shown in FIG. 1.

In accordance with the figure toy 1 shown in FIG. 1, a toy body 2 has an 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 (a vinyl chloride resin) possible to generate an internal sound which can be sensed by the sound sensing member, by bringing the surface member 21 into contact with a finger and the like. The surface member 21 works as an internal sound generating member. When the figure toy 1 is spoken to a person or the like or the surface member 21 of the figure toy 1 is brought into contact with or is pushed by a finger or the like, the figure toy 1 can speak with a predetermined voice or sound, can move a hand, an ear or the like, and can emit a light on a cheek, according to the sound including an external sound such as the spoken sound and the like, and an internal sound generated from the internal sound generating member, i.e., the surface member 21 itself.

A predetermined opening portion 23 is formed around

a mouth of the toy body 2. A condenser microphone 3 is provided at around the opening portion 23 on the toy body 2, as shown in FIG. 2, to work as a sound sensing member. The condenser microphone 3 senses the sound (the external sound) from the outside or the generated internal sound by the surface member 21 on the toy body 2, thereafter outputs a sound signal on the basis of the sensed sound. The outputted sound signal by the condenser microphone 3 is amplified by an amplifier circuit 4 and sent to a judgement circuit 5. By the judgment circuit 5, the outputted sound signal is judged, for example, whether it is a sound having an audio-frequency. Thereafter, for example, only when the sensed sound signal is a sound having an audio-frequency and the judgment thereof is good, it is sent to a control section 9.

In particular, it is not limited, but the control device is composed of the condenser microphone 3, the amplifier circuit 4, the judgement circuit 5, and the control section 9. The figure toy 1 comprises a sound output section 6, a driving section 7, and a light emission section 8, as controlled objects by the control device. Further, the figure toy 1 comprises selector switches SW 1 to SW 3 for selecting one from the modes of a sound output, a movement of a hand, a ear or the like, and a light emission on the cheek.

The selector switch SW 1 outputs a SW 1 signal to the control section 9 for controlling the mode of the sound output, the selector switch SW 2 outputs a SW 2 signal for controlling the mode of the movement of a hand or the like, and the selector switch SW 3 outputs a SW 3 signal for controlling the mode of the light emission on the cheek.

The control section 9 controls the sound output section 6, the driving section 7, and the light emission section 8 on the basis of inputs of a judgement result judged by the judgement circuit 5 and a selector signal selected by the selector switches SW 1 to 3.

For example, when the selector switch (SW 1) is turned on, the SW 1 signal is inputted into the control section 9. In this state, when the judgement result is inputted into the control section 9, the control section 9 outputs a sound output signal to the sound output section 6. Further, when the selector switch (SW 2) is turned on, the SW 2 signal is inputted into the control section 9. In this state, when the judgement result is inputted into the control section 9, the control section 9 outputs a movement signal to the driving section 7. When the selector switch (SW 3) is turned on, the SW 3 signal is inputted into the control section 9. In this state, when the judgement result is inputted into the control section 9, the control section 9 outputs a light emission signal to the light

emission section 8.

The sound output section 6 further comprises a sound circuit, a D/A converter, an amplifier circuit, a speaker, and so on, which are not shown in figures. The sound output signal from the control section 9 is converted into an analogue signal and amplified by the D/A converter, thereafter a sound on the basis of the sound output signal is generated, for example, from the speaker provided in the inside of a mouth or the like of the toy body 2.

The driving section 7 further comprises a motor, a linkage, a gear mechanism, and so on, which are not shown in figures. The motor is rotated on the basis of the movement signal from the control section 9, thereafter the rotation driving power is transferred to the linkage, the gear mechanism, or the like, thereby the toy body 2 takes a predetermined action, e.g., a movement action for moving a hand or an ear.

The light emission section 8 further comprises a LED (Light Emitting Diode) and so on, which are not shown in figures. For example, the light emission section 8 provided in an inside of the cheek on the toy body 2 emits a light on the basis of the light emission signal from the control section 9.

According to the figure toy 1 comprising a

construction like this, various plays can be carried out, as follows.

That is, after putting a battery into the toy body 2, the SW 1 is turned on. In this state, when a player talks to the figure toy 1, the sound (the external sound) is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereafter a judgment result by the judgment circuit 5 is inputted into the control section 9.

Thereafter, by the inputs of the judgment result and the SW 1 signal, the sound output signal is outputted to the sound output section 6 by the control section 9, thereby a predetermined sound is generated from the inside of the toy body 2.

Further, in the state that the SW 1 is turned on, when one portion on the toy body 2 of the figure toy 1 is stroked, pushed, or struck, 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. The generated internal sound is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereby the judgement result by the judgment circuit 5 is inputted into the control section 9.

Thereafter, by the inputs of the judgment result and

the SW 1 signal, the sound output signal is outputted to the sound output section 6 by the control section 9, thereby a predetermined sound is generated from the inside of the toy body 2.

As described above, the surface member 21 of the toy body 2 is made of a soft, flexible and thick synthetic resin, or a material for generating an internal sound by touching it with a finger or the like. Therefore, when one portion on the surface member 21 is touched with a finger or the like from the outside, a various types of vibration are generated on the portion by a friction through stroking or a pushing. As a result, the vibrated portion on the surface member 21 generates an internal sound.

Further, the SW 2 is turned on and in this state when a child or the like talk to the figure toy 1, the voice (the external sound) is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereby the judgment result by the judgment circuit 5 is inputted into the control section 9.

By the inputs of the judgment result and the SW 2 signal, the movement signal is outputted to the driving section 7 by the control section 9, thereby the toy body 2 takes a predetermined action.

Further, in the state that the SW 2 has been turned on, one portion on the toy body 2 of the figure toy 1 is pushed, the pushed portion on the surface member 21 is vibrated or transformed to generate an internal sound such a fricative or another sound. The generated internal sound is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereby the judgement result by the judgment circuit 5 is inputted into the control section 9.

By the inputs of the judgment result and the SW 2 signal, a movement signal is outputted to the driving section 7 by the control section 9, thereby the toy body 2 takes a predetermined action.

When the SW 3 is turned on and the SW 2 is turned on and in this state when we talk to the figure toy 1, the sound (the external sound) is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereby the judgment result by the judgment circuit 5 is inputted into the control section 9.

By the inputs of the judgment result and the SW 3 signal, a light emission signal is outputted to the light emission section 8 by the control section 9, thereby a predetermined portion of the toy body 2 emits a light.

In the state that the SW 3 has been turned on, when

one portion on the toy body 2 of the figure toy 1 is pushed by a finger or the like, the portion on the surface member 21 is vibrated or transformed to generate an internal sound. The generated internal sound is sensed by the condenser microphone 3 and amplified by the amplifier circuit 4, thereby the judgement result by the judgment circuit 5 is inputted into the control section 9.

By the inputs of the judgment result and the SW 3 signal, the light emission signal is outputted to the light emission section 8 by the control section 9, thereby a predetermined portion of the toy body 2 emits a light.

According to the figure toy 1 of the embodiment, not only on the basis of sensing an external sound but also on the basis of sensing a touch, e.g., a pushing by a finger or the like, to the surface member 21 of the toy body 2 to generate an internal sound, the figure toy 1 can take a predetermined action or indication. As a result, it is possible to provide a toy which can give varied plays and a large interest to children and the like.

Further, according to the figure toy 1, one sound sensing member can work as not only a sound sensor but also a pressure sensor, substantially. Therefore, as compared with providing both the sound sensor and the pressure sensor in the control device, it is possible to be simplify the structure thereof.

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 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.

Further, although only an embodiment in which the control device is applied to the toy body 2 of the figure toy 1 has been explained, of course, the control device can be applied to a vehicle toy, another toy, or various types of devices.

In the above-described embodiment, although the surface member 21, that is the internal sound generating member, is made of a flexible and thick synthetic resin (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 possible to be sensed by the sound sensing member by touching 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.

Further, although the condenser microphone 3 that is the sound sensing member, is disposed at around the opening portion 23, the sound sensing member may be disposed anywhere possible to sense the external sound and the generated internal sound by the internal sound generating member.

In the above embodiment, although the judgment circuit 5 judges whether the sensed sound signal by the sound sensing member has an audio-frequency band, the judgement circuit 5 may judge the sensed sound signal on the basis of a frequency band other than the audio-frequency band and it is possible to fix the judgment basis optionally.

Further, the control section may give a first function to the circuit member only when the sound sensing member senses a sound with a first frequency band near the internal sound generated by the internal sound generating member, and the control section may give a second function different from the first function to the circuit member when the sound sensing member senses another sound with a second frequency band apart from the internal sound. According to a figure toy having such a construction, the action of the figure toy when being talked to a child or the like can be made to be different from the action of the

figure toy 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, a main effect will be explained, as follows.

The control device control device comprises: a covering body at least one portion of which has a flexibility, for covering a control section; 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

According to the control device, not only in case of having sensed the external sound by the sound sensing member but also in case of having generated the internal sound by the internal sound generating member, in other words in case of having brought any portion having the flexibility into contact with a finger or the like, it is possible for the control section of the control device to control a predetermined circuit member on the basis of a

outputted sound signal by the sound sensing member.



What is claimed is:

1. A control device comprising:

a covering body for covering a control section;

an internal sound generating member for generating an internal sound by bringing the covering body 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; and

the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

2. A control device comprising:

a covering body at least one portion of which has a flexibility, for covering a control section;

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; and

the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.



3. The control device as claimed in claim 2, wherein the covering body is made of a material for generating an internal sound which can be sensed by the sound sensing member by bringing any portion having the flexibility into contact with a finger or the like from the outside.

4. The control device as claimed in claim 2, wherein the internal sound generating member for generating an internal sound by bringing any portion having the flexibility into contact with a finger or the like from the outside is arranged in an inside of the covering body.

5. The control device as claimed in any one of claims 1 and 2, wherein the sound sensing member is arranged anywhere at which the external sound and the generated internal sound by the internal sound generating member can be sensed.

6. The control device as claimed in any one of claims 1 and 2, wherein the control section controls the function of the predetermined circuit member when the sound to be sensed by the sound sensing member has an audio-frequency band.

7. The control device as claimed in any one of



claims 1 and 2, wherein the control section outputs a signal for generating a predetermined sound on the basis of the outputted sound signal by the sound sensing member.

8. The control device as claimed in any one of claims 1 and 2, wherein the control section outputs a signal for moving a predetermined portion of the device on the basis of the outputted sound signal by the sound sensing member.

9. The control device as claimed in any one of claims 1 and 2, wherein the control section outputs a signal for emitting a light from a predetermined portion on the basis of the outputted sound signal by the sound sensing member.

10. The control device as claimed in any one of claims 1 and 2: wherein the control section gives a first function to the circuit member only when the sound sensing member senses a sound with a first frequency band near the internal sound generated by the internal sound generating member, and the control section gives a second function different from the first function to the circuit member when the sound sensing member senses another sound with a second frequency band apart from the internal sound.



11. A figure toy comprising the control device which comprises: a covering body for covering a control section; an internal sound generating member for generating an internal sound by bringing the covering body 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.

12. A figure toy comprising the control device which comprises: a covering body at least one portion of which has a flexibility, for covering a control section; 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; and the control section for controlling a function of a predetermined circuit member on the basis of the outputted sound signal by the sound sensing member.



13. The figure toy as claimed in claim 11 or 12, wherein the figure toy has a shape selected from the group consisting of a person doll, an animal doll, a plant doll, and an animated character doll.

14. The figure toy as claimed in claim 11 or 12: wherein the control section gives a first function to the circuit member only when the sound sensing member senses a sound with a first frequency band near the internal sound generated by the internal sound generating member, and the control section gives a second function different from the first function to the circuit member when the sound sensing member senses another sound with a second frequency band apart from the internal sound.

15. The control method comprising the steps of:
generating an internal sound by bringing a covering body into contact with a finger or the like,
sensing an external sound and the generated internal sound to output a sound signal, and
controlling a function of a predetermined circuit member on the basis of the outputted sound signal.