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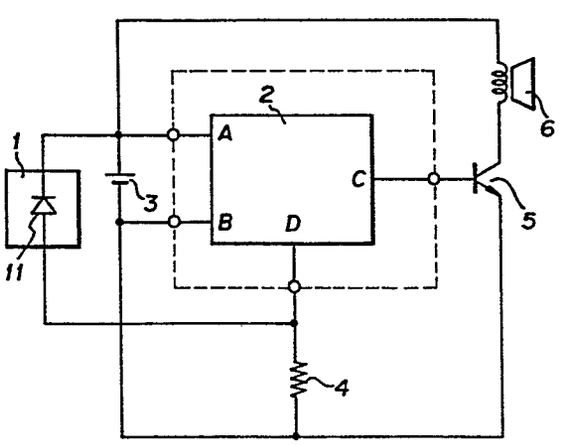
(54) **Means for generating audio-frequency.**

(57) Means for generating audio-frequency is disclosed wherein voice, melody and so on are produced in accordance with contents stored in an integrated circuit to which sensor signal is applied if the level of light, heat, sound and so on are higher than a predetermined reference level.

FIG. 1



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BACKGROUND OF THE INVENTION

The invention relates to means for generating audio-frequency, and more particularly to means for generating audio-frequency to give voice, music etc. having predetermined contents in accordance with the detection of light, heat, sound etc.

There has been used an electronic musical box in which electronic circuits is provided. In the electronic musical box, a start switch is turned on, for instance, by opening a lid thereof to activate the electronic circuits whereby a speaker connected thereto produces a melody etc.

According to the conventional musical box, however, the start switch must be manually turned on to activate the electronic circuits so that it is not appropriate to present the electronic musical box in such a situation where a person receiving the electronic musical box is surprised or impressed to hear the melody produced thereby.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide means for generating audio-frequency to give voice, music etc. having predetermined contents by detecting light, heat, sound etc.

It is another object of the invention to provide means for generating audio-frequency wherein the electronic circuit is automatically activated without the necessity of manual operation.

It is still another object of the invention to provide means for generating audio-frequency wherein a person is surprised

or impressed to hear voice, music etc. to be automatically produced therein.

According to the invention, means for generating audio-frequency comprises sensor for detecting light, heat, sound etc., integrated circuit for generating such audio-frequency as voice, music etc. stored therein in accordance with detecting signal of the sensor, and output circuit for giving the voice, music etc. from a speaker by amplifying output signals of the integrated circuit.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in detail hereinafter in preferred embodiments in accordance with the accompanying drawings in which,

Fig. 1 is circuit diagram for illustrating a preferred embodiment of the invention,

Fig. 2 is block diagram for illustrating a sensor used in the embodiment of Fig. 1, and

Fig. 3 is a cross-sectional view for illustrating a candle to which means for generating audio-frequency according to the invention is applied.

DESCRIPTIONS OF THE PREFERRED EMBODIMENTS

In Fig. 1, there are provided sensor 1 to decrease the value of resistance between terminals of outputs when the level of light, heat, sound etc. becomes a predetermined one, integrated circuit 2 for generating audio-frequency corresponding to voice, melody etc. previously stored therein when the resistance value

is lowered to a predetermined level, battery 3 for supplying a power source to audio-frequency generating means, resistance 4 connected in series to output terminal of the sensor 1 to apply the potential between outputs thereof to D terminal of the integrated circuit 2, transistor 5 for amplifying output signal of the integrated circuit 2, and speaker 6 connected between collector of the transistor 5 and the battery 3 for producing voice, melody etc.

The sensor 1 is composed of photo-transistor 11 in case of the detection of light. Thermistor is used in place of the photo-transistor 11 in case of the detection of heat. Further, sensor circuit is used as illustrated in Fig. 2 in case of the detection of sound like a clapping of hands.

In Fig. 2, there are provided microphone 12, amplifier 13 for amplifying output signal of the microphone 12 to a predetermined level, schmidt circuit 14 for producing high signal "1" when the output signal of the amplifier 13 is over a predetermined level, transistor 15 being turned on by receiving the high signal "1" from the schmidt circuit 14, resistance 16 connected to emitter of the transistor 15 and another end of which is connected to D terminal and resistance 4 as shown in Fig. 1, and power source +B connected to collector of the transistor 15.

The operation of means for generating audio-frequency will be explained hereinafter wherein the sensor 1 is composed of the photo-transistor 11 so that the integrated circuit 2 is activated in accordance with the detection of light.

In Fig. 1, the integrated circuit 2 is connected at the terminal A to the positive terminal of the battery 3 while at the terminal B to the negative terminal thereof. The integrated circuit 2 is constructed such that it generates audio-frequency at the terminal C thereof when it receives the reference potential more than one-half of the potential of the battery 3 at the terminal D thereof. If the output of audio-frequency is appeared at the terminal C of the integrated circuit 2, the transistor 5 is thereby activated so that voice, melody etc. stored therein is produced by the speaker 6.

In order to apply the high potential than the reference potential to the terminal D of the integrated circuit 2, the photo-transistor 11 of the sensor 1 receives light to be thereby decreased the internal resistance thereof. Accordingly, the voltage at the voltage deviding point (hot end side of resistor 4) is increased in proportional to the decrease of the resistance of the photo-transistor 11. The activation of the integrated circuit 2 is ceased when the potential of the voltage deviding point becomes less than the reference potential due to the decrease of light received by the photo-transistor 11.

Fig. 3 shows a candle for birth-day, wedding ceremony, christmas etc. wherein the means for generating audio-frequency is adopted. The candle 30 comprises main body 31 of paraffin shaped cylindrical, and a wick 32 positioned through the center of the main body, bottom box 33 provided at the bottom portion of the main body 31, and optical fiber 34 positioned along the wick 32.

The optical fiber 34 is exposed from the top of the main body 31 at one end thereof while it faces the photo-transistor 11 at another end thereof. The photo-transistor 11 is contained in the bottom box 33 together with the integrated circuit 2, battery 3, transistor 5, and speaker 6 as shown therein.

In operation, if the wick 32 is fired at the top thereof, the light is transmitted through the optical fiber 34 to be received by the photo-transistor 11. The photo-transistor 11 is decreased in internal resistance by the detection of the light so that electric current is increased through the resistance 4 to thereby produce the potential exceeding the reference potential at the both terminals of the resistance 4. Accordingly, such an output as voice, melody etc. is produced by the speaker 6 as a result of the function as explained before.

Contents to be stored in the integrated circuit 2 may includes human voice in accordance with synthesized voice, cry, song or call of animals or birds, canon or scriptures of religion, sermon, practicing sentences of foreign languages and so on. The integrated circuit 2 may be exchanged in the from of a chip depending upon the contents stored therein.

In place of the embodiment of the candle 30 in Fig. 3, the following embodiments may be adopted.

(a) An integrated circuit is contained in a book so that the integrated circuit is activated by detecting light in accordance with the opening of the book.

(b) An article containing an integrated circuit is installed in a bed room whereby the integrated circuit is activated to announce the morning by detecting the morning light.

(c) An integrated circuit is provided on the front surface of Buddhist image so that a photo-transistor is irradiated to give sermon for followers.

(d) An integrated circuit is provided in a car so that a driver is given a warning by detecting light of head lumps of following car.

Another embodiment of the invention will be explained hereinafter wherein an integrated circuit is provided at the bottom portion of an ashtray. A metal wire of a predetermined heat transfer rate is provided through the ashtray such that one end thereof is exposed over the top surface thereof while another and thereof is connected to a thermistor included in a sensor.

In operation, if a cigarette smoker puts a cigarette on the top surface of the ashtray, the heat of the cigarette is transmitted through the metal wire to the thermistor so that the internal resistance of the thermistor is decreased to apply the potential higher than the reference level to C terminal of the integrated circuit. Accordingly, the cigarette smoker can enjoy listening to the music produced therein while smoking the cigarette.

Still another embodiment of the invention will be explained hereinafter wherein means for generating audio-frequency according to the invention is installed in a bed room for a baby.

In operation, if the baby cries, the transistor 15 is turned on by receiving high signal "1" from the schmidt circuit 14 so that the potential +B higher than the reference level is applied through the resistance 16 to D terminal of the integrated circuit 2 as shown in Figs. 1 and 2.

Accordingly, a nurse or mother can be warned even if she is in a room remote from the bed room by transmitting the audio-frequency through signal wires from the bed room to her room.

Although the invention was described with reference to preferred embodiments, it is understood that the invention may be changed, altered or modified within the spirit of the scope of claims.

The features disclosed in the foregoing description, in the claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

What we claim is;

(1) Means for generating audio-frequency comprising,

sensor for detecting an energy the level of which is higher than a reference level,

integrated circuit for generating audio-frequency in accordance with contents stored therein if said sensor detects said energy, and

output circuit for producing voice, music etc. corresponding to said audio-frequency.

(2) Means for generating audio-frequency according to claim 1,

wherein said energy is of one selected from light, heat or sound, and said sensor is of one selected from photo-transistor, thermistor or sound detecting circuit depending upon the selected energy.

(3) Means for generating audio-frequency according to claim 1,

wherein said sensor is composed of photo-transistor for detecting the fire of a candle by means of optical fiber transmitting the light thereof to said photo-transistor.

(4) Means for generating audio-frequency according to claim 1,

wherein said sensor is composed of thermistor for detecting the heat of a cigarette on an ashtray by means of metal wire transferring the heat to said thermistor.

(5) Means for generating audio-frequency according to claim 1,

wherein said sensor is sound level detecting circuit for detecting a clapping of hands, a cry of a baby and so on.

FIG. 3

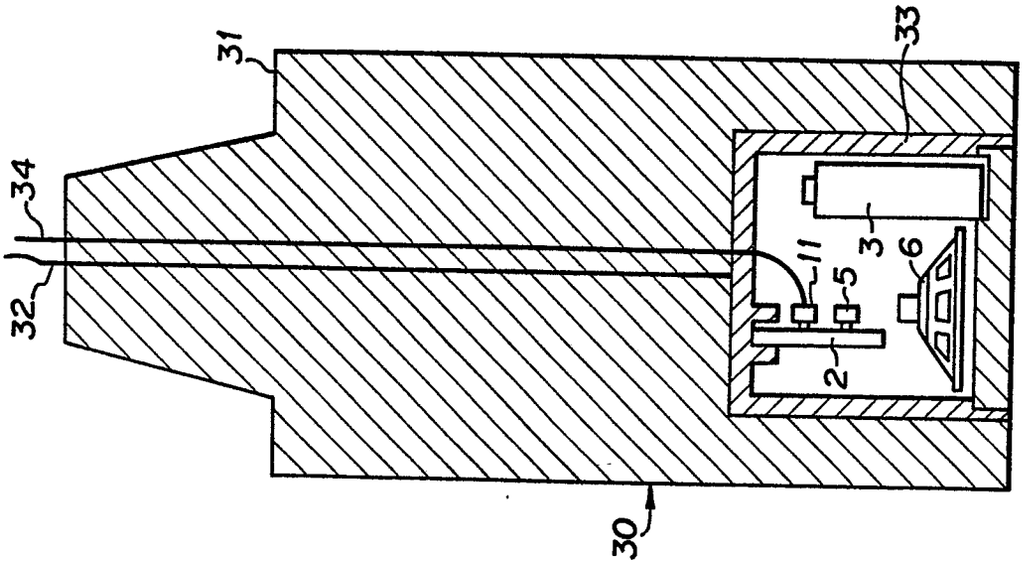

FIG. 1

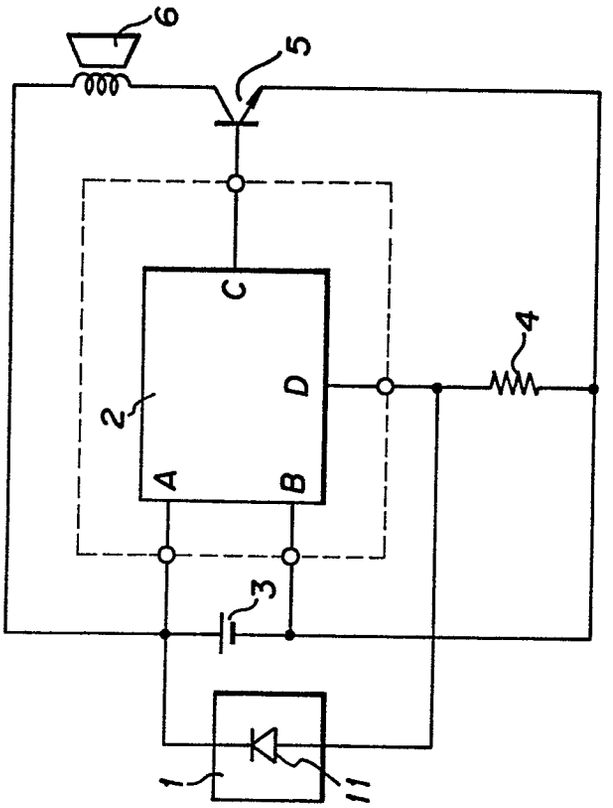

FIG. 2