This invention relates to an ornamental device that projects designs onto the internal surface of a light-transmitting portion of the device so that the projected designs are visible externally, plays audio sounds related to the subject of the ornamental device and moves one or more appendages in a repetitive or reciprocating manner.
ORNAMENTAL DEVICE WITH AUDIO PLAYER, RECIPROCATING APPENDAGE AND PROJECTION OPTICS

FIELD OF THE INVENTION

[0001] The present invention relates to a self-contained, electrically operated ornamental device made of an advanced optic projection system incorporating a pattern wave function, advanced audio playback system and one or more reciprocally operated appendage(s).

BACKGROUND OF INVENTION

[0002] Ornaments and ornamental devices have long been used to recognize holidays such as Christmas and Halloween. The ornaments are typically displayed indoors or outdoors, e.g., from trees, buildings, store front signs or placed on the ground or floor. Generally, there has been the use of both bulbs and strings of lights. Often times, the strings of lights might be to the exterior of a cutout shape, to form an image character such as Santa Claus, a reindeer, snowmen, etc. Other times, the ornamental devices emit sounds.

[0003] A wide variety of lighted holiday ornaments and ornamental devices is, currently, available on the commercial market and an even larger number of these types of devices are known in the art lighted holiday ornaments. For example, the miniature electric light bulb sets for decorative illumination disclosed by Matsuya in U.S. Pat. No. 4,228,486; the lighted ornament disclosed by Phil-Niedereman et al. in U.S. Pat. No. 5,772,312; the decorative lighting system in cluster arrangement disclosed by Barthelemess in U.S. Pat. No. 5,868,490; the lamp disclosed by Jones in U.S. Pat. No. D262,743; the star ornament light disclosed by Edwards in U.S. Pat. No. D386,279; and the lighted ornament disclosed by Sims in U.S. Pat. No. D425,442.

[0004] Other examples of prior art devices include an ornament producing sound by a mechanical means (similar to a magic box) also having an electronic light control (U.S. Pat. No. 6,291,749 to Tseng); a ball that emits light and sound in response to impact (U.S. Pat. No. 6,251,035 to Fa) and a Halloween toy (U.S. Pat. No. 5,584,741 to Cheung) that has a rubber or plastic representation of a face and emits sound and lights.

[0005] These ornamental devices and other available ornamental devices are either stationary without moving parts and/or without sounds or lights that work in concert for a unified, pleasing effect on the observer.

SUMMARY OF INVENTION

[0006] In one aspect, the present invention relates to a self-contained, electrically operated ornamental device made of an advanced optic projection system incorporating a pattern wave function, advanced audio playback system and one or more reciprocally operated appendage(s). The advanced optic system of the present invention incorporates, for example, LEDs as a light source wherein the LEDs project light through a rotational projection ball for the display of lighted designs on the light-transmitting body of the ornamental device. Additionally, the audio system of the present invention incorporates, for example, self-contained audio effects and/or plays audio effects from an external source. Further, the reciprocally operated appendage(s) of the present invention operate, for example, by means of a level mounted pivotally to an eccentric circle operationally connected to an electric motor. In a preferred embodiment, the lights, sound and movement of the present invention are synchronized to provide a unified effect for the pleasure of the observer.

BRIEF DESCRIPTION OF DRAWINGS

[0007] FIG. 1 shows a three-dimensional schematic diagram of one exemplary embodiment of the self-contained ornamental device of the present invention.

[0008] FIG. 2 shows an exploded view of one exemplary embodiment of the present invention.

[0009] FIG. 3 shows a three-dimensional schematic diagram of the components of one exemplary embodiment of the reciprocating appendage of the present invention.

[0010] FIG. 4 shows an exploded view of one exemplary embodiment of the reciprocating appendage of the present invention.

[0011] FIG. 5 shows a three-dimensional schematic diagram of one embodiment of the projection system of the present invention.

[0012] FIG. 6 shows an exploded view of one exemplary embodiment of the projection system of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0013] The invention will now be described in detail with reference to a few preferred embodiments, as illustrated in accompanying Figures. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that the invention may be practiced without some or all of these specific details. In other instances, well-known features and/or process steps have not been described in detail in order to not unnecessarily obscure the invention. The features and advantages of the invention may be better understood with reference to the Figures and discussions that follow.

[0014] The present invention relates to, in one embodiment, a self-contained, electrically operated animated ornamental device, comprising: light projection system for projecting a rotating image on the internal surface of a light-transmitting portion of the ornament incorporating a pattern wave function. A “pattern wave function” is defined herein as a predefined or random sequence of lights to be projected by the light projection system. The pattern wave function may be, for example, synchronized with sounds and/or motions also provided by the ornamental device of the present invention.

[0015] The light projection system comprises light emitting diodes (LEDs) that are located within a rotational projection ball. The rotational projection ball has a plurality of patterns through which light from the LEDs may be projected. The light that is projected through the designs in the rotational projection ball is then projected on the interior of the ornamental device. At least a portion of the ornamental device is made of light-transmitting material so that the light projected from the rotational projection ball
can be seen from the exterior of the ornamental device. In other words, the design images can be seen by a viewer since the ornamental device is designed to allow the images to shine through the light-transmitting material of the ornamental device. It will be clear that the rotational projection ball need not be round or circular though a "ball" shape is a preferred embodiment of the present invention. It will also be apparent that the invention is not limited by the number of LEDs used to project light from within the rotational projection ball. In the preferred embodiment, the number of LEDs number from 1 to about 12. Also, the LEDs of the present invention are not limited to the certain number of colors. The colors many number as few as one or as many as the number of LEDs present in the ornamental device. In one embodiment of the present invention, the rotational projection ball of the present invention is rotated by an electric motor. In another embodiment of the present invention, the LEDs may turn on and off in any of a wide number of patterns and sequences. The patterns and sequences of the LEDs are controlled by an electronic control device that may be programmed by the user or may be preprogrammed by the manufacturer, for example.

In another embodiment, the ornamental device of the present invention comprises an audio system. The audio system comprises a play back circuit board, an optional amplifier and a speaker, a volume resistor board and a volume control device. In one embodiment, the audio system is located within an internal cavity of the ornamental device suitable for use as a resonant cavity. The audio playback system of the ornamental device of the present invention may play back sounds selected from analog recordings, digital recordings or a mixture of both analog and digital recordings. In another embodiment, the audio system of the present invention may play back music, voice sounds and/or environmental sounds (e.g., sounds associated with certain holidays such as spooky sounds for Halloween or gobbling sounds for Thanksgiving, etc.), water sounds, animal sounds (e.g., bird sounds, horse sounds, dog sounds, etc.). The audio system of the present invention may also have a volume control resistor board and a volume control device for user control of the volume of the audio playback. Furthermore, the audio system of the present invention may comprise an input socket for the playing sounds through the ornamental device that are not preprogrammed in the device.

The ornamental device of the present invention also comprises one or more reciprocating appendages (or swing arms). The reciprocating appendage(s) comprise a reciprocating lever(s) connected to said appendage at the distal end of the reciprocating lever and connected to an eccentric circle(s) at the proximal end of the reciprocating lever. The eccentric circle is rotationally moved by an electric motor such that when the motor turns the eccentric circle the reciprocating lever is moved back and forth and thereby moves the attached appendage in a repetitive motion.

When the ornamental device of the present invention is powered by an electric power source i) the projection system projects light from said LEDs through the rotational projection ball, which is moved by an electric motor, and on to the interior surface of the light-transmitting portion of said ornament such that projected designs are visible on the external surface of said ornament, ii) the audio system emits sounds and, iii) said electric motor rotates the eccentric circle moving the reciprocating lever(s) which, in turn, moves the appendage(s) in a repetitive motion.

Now, in relation to a non-limiting, exemplary embodiment of the present invention, as shown in FIG. 2, the ornamental device of the present invention comprises a power plug 18 for connection to an electrical power source, a power switch 19 with a power button 20 for turning the ornamental device on, a signal input socket 17 for optional audio input and a volume control knob 16 for adjusting the volume level of the ornamental device. The ornamental device is constructed on a base or chassis 30. The chassis 30 supports the external body of the ornamental device (in the present example parts 2, 3, 22, 26 and 27) and any ornamental decoration attached to said body (in the present example parts 1, 21, 22, 23, 24 and 27). In the present example, the body parts 26 and 27 are made of light-transmitting material.

Continuing with the non-limiting exemplary embodiment of the present invention, as shown in FIG. 2, the chassis 30 supports a speaker 29, a playback circuit board 14, a volume control resistor 15 and, optionally, an amplifier. The chassis 30 also supports the rotational projection ball 13 mounted on a support rod 12, ball mount 11 and electric motor 28. Within the rotational projection ball 13 is located an LED circuit board 31 comprising a number of colored (including white) LEDs numbering from 1 to about 12 and incorporating an electronic control device for selecting the order illumination of the LEDs and, when necessary, synchronization of the projection system with the audio system and/or movement of the reciprocal appendage(s) in another embodiment, the LEDs may emit light with a strobe like effect. In still another embodiment, the control board is separate from the LED circuit board 31. An exemplification of the assembled projection system of the present invention is shown in FIG. 5. An exploded view of the projection system of the present invention is shown in FIG. 6.

Still continuing with the non-limiting exemplary embodiment of the present invention, as shown in FIG. 2, the reciprocating appendage device is mounted on either the chassis 30 or a separate base 10 mounted to the chassis. The reciprocating lever 7 is connected at it’s distal end to the appendage 3 and at it’s proximal end to the eccentric wheel (shown as parts 4, 5 and 6). The eccentric wheel is rotated by an electric motor 8. The electric motor may be mounted on the base plate 10 or chassis 30. The reciprocating level 7 is pivotally mounted on a support bar 9 which is mounted directly on the base 10 or chassis 30. An exemplification of the assembled reciprocating appendage of the present invention is shown in FIG. 3. An exploded view of the reciprocating appendage of the present invention is shown in FIG. 4.

In another exemplary embodiment, the ornamental device of the present invention uses one motor to drive both the rotational projection ball and the reciprocating appendage(s) of the present invention. In yet another exemplary embodiment, the same motor drives both the reciprocating appendages (s) and the rotational projection ball.

It should be apparent to those practiced in the art that the ornamental device need not, and indeed is not, limited to any particular design. Exemplary designs for the ornamental device of the present invention include, for
example, holiday designs (e.g., Christmas snowman [see, FIG. 1] or Santa Claus, Easter bunny, Thanksgiving turkey or pilgrim, Halloween skeleton or ghost, etc.), patriotic designs (e.g., popular politicians or other historical figures), sports organization designs (e.g., team mascots or popular sports figures), fantasy creatures (e.g., dragons, unicorns) etc. Additionally, the shapes of the designs and the number of the designs projected via the rotational projection ball may vary depending on, for example, the design of the ornamental device. Thus, a snowman, for example, may project snow flakes, candy canes and/or haws. The number of the designs projected would only be limited only by the size of the rotational projection ball and the desired size of the projected images. The designs on the rotational projection ball may be cut out of a ball made of opaque material or may be clear areas on an otherwise painted clear ball.

[0024] The ornamental device of the present invention may be made of any suitable material or materials. In a preferred embodiment, the ornamental device is made of plastic. Examples of suitable plastics include, but are not limited to acrylic, polystyrene, polyethylene, polyanime, polyvinylidene chloride, polyethylene terephthalate, polyester, epoxys, high density polyethylene, polycarbonate, ABS (acrylonitrile butadiene styrene), nylon and vinyl chloride. In other embodiments, certain parts of the ornamental device of the present invention (for example, parts subject to wear and/or stress) may be made of metal. Examples of the parts of the present invention that are suitable for construction from metal include several internal parts such as the base plate 10, portions of the electric motor(s) 8 and 28, the reciprocating level 7 and parts of the eccentric circle 4, 5 and 6. Other parts of the ornamental device of the present invention may be made of the material best suited for that purpose. For example, LEDs would include plastic or glass; control circuit boards would be made of materials including metal, plastic and silicon. One practiced in the art would know the preferred materials for these and other various components of the present invention.

[0025] The ornamental device is not limited to any particular size. The device, for example, may be sized to fit on a table indoors or may be sized to be displayed out of doors. In a preferred embodiment, the ornamental device of the present invention is between about 12 inches and 6 feet tall.

What is claimed is:

1. A self-contained animated, electrically operated ornamental device, comprising:
   a. a light projection system for projecting a rotating image on the internal surface of a light-transmitting portion of the ornament, said light projection system, comprising:
      i) light emitting diodes (LEDs) located within ii) a rotational projection ball with a plurality of patterns through which light may be projected wherein said rotational projection ball is rotated by an electric motor and, iii) an electronic control device;
   b. an audio system comprising: i) a play back circuit board, ii) an optional amplifier and a speaker, iii) a volume resister board and, iv) a volume control device, wherein said audio system is located within an internal cavity of the ornamental device suitable for use as a resonant cavity;
   c. one or more reciprocating appendages, said appendage(s) comprising, i) a reciprocating lever connected to said appendage at its distal end and connected to an eccentric circle at its proximal end, said eccentric circle is rotationally moved by said electric motor; and
   d. wherein, when said ornamental device is powered by an electric power source, i) said projection system projects light from said LEDs through the rotational projection ball, which is moved by said electric motor, and on to the interior surface of the light-transmitting portion of said ornament such that projected designs are visible on the external surface of said ornament, ii) said audio system emits sound and, iii) said electric motor rotates said eccentric circle moving said reciprocating lever which, in turn, moves said appendage(s) in a repetitive motion.

2. Said ornamental device of claim 1, wherein a first electric motor moves the rotational projection ball and a second electric motor moves said eccentric circle.

3. Said ornamental device of claim 1, wherein said audio system plays a digital audio signal, an analog audio signal or a combination thereof.

4. Said ornamental device of claim 1, wherein said light emitting diodes number from 1 to about 12.

5. Said ornamental device of claim 1, wherein said light emitting diodes of said projection system are of one or more colors.

6. The ornamental device of claim 1, wherein said audio system plays sounds selected from music, environmental sounds and voices.

7. The ornamental device of claim 1, wherein the shape of said device is selected from a group consisting of a human shape, an animal shape or a the shape of a fantasy creature.

8. The ornamental device of claim 1, wherein said human shape is a snowman.

9. The snowman of claim 8, wherein said reciprocating appendage is an arm and said arm lifts and lowers a hat.

10. The ornamental device of claim 1, wherein said audio system has a device for connection to an external source of recorded sound.

11. The ornamental device of claim 1, wherein two of more of said light projection system, said audio system and said reciprocating appendage(s) are synchronized with respect to each other.

12. The ornamental device of claim 1, wherein said rotational projection ball rotates at a rate of between about 2-5 rotations per minute.

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