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(54) ILLUMINATING ANIMATION DEVICE

(57) An illuminating animation device comprising: a housing compartment comprising a base and a film secured together via a wall that extends therebetween, wherein the film includes an image cut therein; a divider secured within the housing compartment, which divides the compartment into a first and second chamber; a printed circuit board secured to the base within the housing compartment, wherein the printed circuit board includes a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber; a microcontroller unit secured to the base and electrically connected to the printed circuit board; and a power source electrically connected to the microcontroller unit.

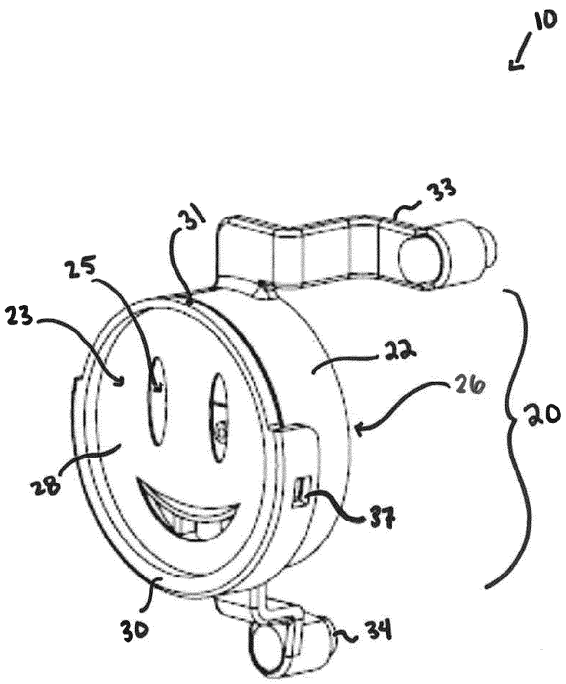

Fig. 1

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Description

CROSS-REFERENCES

[0001] This application is a continuation-in-part of and claims the benefit of U.S. Serial Application no. 17/335,447 filed on June 1, 2021 and further claims priority from provisional application serial no. 63/263,994, filed November 12, 2021 and 63/269,724 filed on March 22, 2022. All publications, patents and patent applications referred to herein are incorporated by reference in their entirety.

FIELD OF INVENTION

[0002] The present invention relates to an illuminating animation device, particularly a toy, that illuminates through a film to produce an animation. More particularly, the illumination is sound activated, so the animation is produced in concert with the sound.

BACKGROUND OF THE INVENTION

[0003] Devices that use light emitting diodes ("LEDs") located within various chambers of a device to produce an animation exist. However, these devices do note create a clear image when the animation is produced. Moreover, these devices are not capable of being easily secured into different toys. Moreover, these devices do not have interchangeable films with differing images that produce a variety of animations.

[0004] Furthermore, devices that illuminate in synchronization with a song exist. However, these devices are significantly limited in use as the synchronization of the LEDs with the song is preprogrammed into an integrated circuit within the device. Accordingly, the devices are not sound activated via ambient sounds detected by the device. Moreover, these devices do not store the sounds that are detected in a memory of the device for later use and activation. Thus, there is little versatility with these existing devices.

SUMMARY OF THE INVENTION

[0005] This object is solved by the features of the independent claim. The dependent claims contain advantageous embodiments of the present invention. Particularly, the invention according to some aspects preferably concerns a device that creates animation via the illumination of various LEDs through a film into which an image is cut. The film includes an image cut therein. The device includes a housing with a housing compartment formed by the film connected to a base via a wall. Secured within the housing compartment is a divider, which divides the compartment into a first and second chamber. A printed circuit board is secured within the compartment and includes a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber. A microcontroller unit controls the illumination of the first and second LEDs in conjunction with sound detected by a microphone from the environment or from a speaker to animate the image cut into the film. The illumination of the LEDs is also activated in concert with sounds emanated through the speaker via sequences that are preprogrammed into the microcontroller unit.

The invention also concerns a toy comprising at least one illuminating animation device of the claims.

BRIEF DESCRIPTION OF THE FIGURES

[0006]

Figure 1 is a side, perspective view of one embodiment of an illuminating animation device.

Figure 2 is a side, perspective, exploded view of the illuminating animation device of Figure 1.

Figure 3 is a back, transparent view of the illuminating animation device of Figure 1.

Figure 4a is a front view of the illumination animation device of Figure 1 secured within a pumpkin enclosure, which shows a first animated image.

Figure 4b is a front view of the illumination animation device of Figure 1 secured within a pumpkin enclosure, which shows a second animated image.

Figure 5 is a side, partially open view of the illumination animation device of Figure 1 secured within a globular enclosure.

Figure 6 is a side, perspective, exploded of the illuminating animation device of Figure 1 secured within a bubble producing toy.

Figure 7 is a side, perspective, exploded view of the illuminating animation device of Figure 1 secured within an inflatable balloon toy.

Figure 8 is a side, partially exploded view of the illuminating animation device of Figure 1 secured within a plush toy.

Figure 9 is a front view of the illuminating animation device of Figure 1 secured within a pumpkin enclosure and affixed to a lanyard.

Figure 10 is a flow chart demonstrating one embodiment of the electronic capabilities of the illuminating animation device securable within the inflatable balloon toy shown in Figure 7.

Figure 11 is a partially exploded view of the illuminating animation device of Figure 1, wherein a microcontroller unit includes various additional electronic features.

DETAILED DESCRIPTION

[0007] Figures 1-3 show an illuminating animation device 10 and Figures 4a, 4b and 5-9 show various toys into which the illumination animation device is secured. These toys should not be construed as limiting as the animation device advantageously secures into or onto

any structure. As shown in Figures 1-3 and 5-6, one way in which the device secures into or onto other structures is via a bracketing system that includes an upper 33 and lower bracket 34, which are secured to or soldered to the outside surface of a wall 22. The device 10 is securable by any suitable methods specific to the toy into which it is being secured, for example, via screws or glue. The features described herein for the standalone animation device 10 are interpreted as applying to the embodiments of the animation device when it is secured into or onto other structures. While certain features or elements may be rearranged when the device 10 is secured into or onto other structures, for example, the location of a power supply, the disclosures herein shall be understood to apply to all embodiments, particularly the electronic capabilities and features of the device 10.

[0008] As shown in Figures 1-3, the illuminating animation device 10 includes a cylindrically shaped housing 20, which includes a cylindrically shaped cover 30 secured to a front face 23 thereof and a cylindrically shaped base 21 secured to a back face 26 thereof. In between the cover and the base 21 is a cylindrically shaped wall 22 that extends from the base 21 to the cover 30. The extension of the wall 22 between the two faces 23, 26 forms a housing compartment 25 where various internal components of the device 10 are secured. The cylindrically shaped cover 30 includes a slot 31 therein, which tightly fits a film 28 when slid therein.

[0009] As shown in Figures 1-3, particularly Figure 2, the device 10 includes the cover 30, which is secured around the front face 23 of the device to the wall 22. As shown in Figures 1-2, the cover 30 includes notches 37, which correspond with clasps 27 that form a part of the wall 22, so the cover 30 easily snaps onto the wall 22. The cover 30 includes a slot 31 into which the film 28 snuggly fits. For example, as shown in Figure 2, the cover 30 is generally open so when the film 28 is positioned into the slot 31, the film 28 encompasses the central opening of the cover 30. Advantageously, the film 28 is tightly secured within the cover 30 so when the device 10 is flipped upside down, the film 28 does not slide out. Further, the film 28 is easily removeable and interchangeable with different films with different images. The film 28 is, for example, an opaque black with a matte finish acetate sheet with an image die cut onto the film 28. In this embodiment, the film 28 includes a first image 29 carved therein, which is a smiley face with two eyes and a mouth. Any image can be carved or cut into this film 28 depending on user specification. Further, if desired, the film 28 forms the outermost portion of the front face 23 and includes a securing mechanism to connect to the wall (see Figure 11).

[0010] As shown in Figures 1-3, particularly Figure 2, the wall 22 extends from the base 21 to the cover 30 and forms a housing compartment 25 where various internal components are secured. The housing compartment 25 is divided into a first chamber 38 and a second chamber 40 via a chamber divider 36. The divider 36 is secured or soldered onto two opposing inside surfaces of the wall 22. As the first image 29 is a smiley face, the divider 36 is curved to correspond with the u-shape of the mouth. The divider 36 is advantageously located so that any image 29 containing a mouth will benefit from the desired animation effect, i.e., that the device 10 is talking (See animated images 12, 14 in Figures 4a and 4b). The number of chambers 38, 40 varies depending on the image 29 that is etched into the film 28, the size of the device 10 and/or the desired animation effect. As shown in Figure 3, the film 28 is secured adjacent to the first chamber 38 and second chamber 40 so that the eyes and an upper portion of the mouth are aligned within the first chamber 38 and a lower portion of the mouth is aligned within the second chamber 40. This specific positioning of the first image 29 adjacent to the first and second chambers 38, 40 aids in producing the desired talking animation effect of the first image 29 (see animated images in Figures 4a and 4b).

[0011] As shown in Figures 2-3, the first chamber 38 has a first LED 44 secured therein and the second chamber 40 has a second LED 46 secured therein. The LEDs 44, 46 are one color and/or vary in color and/or luminosity. The number of LEDs 44, 46 varies depending on factors such as the number of chambers 38, 40 present in the housing 20, the image carved into the film 28 and the desired animation effect. Both LEDs 44, 46 are secured and electrically connected to a printed circuit board ("PCB") 42, which PCB 42 is secured within the back face 26 of the housing, for example via screws 43. As shown in Figure 2, the base 21 of the device 10 is manufactured to include a compartment 47 into which the PCB 42 and LEDs 44, 46 secure. The LEDS 44, 46 are secured to the PCB 42 using surface mounting technology. Advantageously, the inventors discovered the precise distance that the first and second LEDs 44, 46 should be secured from the film 28 to produce a clear animation image, regardless of whether it is being projected onto or into another surface. Specifically, the distance from the LEDs 44, 46 to the film 28 is important to control the size and location of the image that is projected through the film 28 so that a clear, readable image is produced. The distance from the LEDs 44, 46 to the film 28 is from about 5 mm to about 15 mm and creates a crisp, precise animated image that is easily recognizable to the eye.

[0012] However, in other embodiments, this distance varies depending on the apparatus into which the device 10 is secured, the size of the device 10, the number of LEDs 44, 46, and the image 29 that is etched into the film 28. For example, when the device 10 is secured into an enclosure 100, 101, 114, such as shown in Figures 4a, 4b-6 and 9, the image 29 cut on the film 28 magnifies when illuminated onto an inside surface of the closure so the image 29 appears larger than the size of the film 28 when it is projected thereon. As shown in Figures 4a and 4b, the device 10 is secured within the enclosure 100, 101, 104 and is smaller in size than the enclosure 100, 101, 104. However, since the device 10 is also lo-

cated at the precise distance from the inside of the enclosure 100, 101, 104, the face projected onto the inside surface of the enclosure 100, 101, 104 appears much larger through the front face of the enclosure 100, 101, 104, while also being legible. The enclosure 100, 101, 104 is the precise opacity that the light refracts through the enclosure 100, 101, 104 and is clearly visible. For example, as shown in Figure 4a, and 4b, the mouth appears to be speaking based on the illumination of the first and second LEDS 44, 46. Moreover, to aid in producing a desired animation effect, the enclosure 100, 101, 104 includes a silhouette of a face 105, on the front face of the enclosure 100, 101, 104. Accoridngly, when the face is projected through the film 28 onto the silhouette, the animated image is magnified and aligns perfectly with the silhouette. This advantageously creates the illusion of a larger face, than is the size of the face present on the film 28.

[0013] Figures 2 and 11 show different embodiments of the microcontroller unit 50 of the device 10. The orientation and combination of these various capabilities of the microcontroller 50 unit should not be construed as limiting. The microcontroller 50 or PCB 42 combine all features and structures/electronics/circuits. In other implementations, such features are separately implemented. The PCB 42 is electrically connected via wiring 39 to a microcontroller unit 50, which includes various control circuitry. Such circuitry, for example, includes an integrated circuit chip 52, a microphone 56, and a switch 54. The switch 54 is located on an opposite side of the microcontroller unit 50 than the microphone 56 and other control circuitry. The circuitry is used to control the desired animation effect and other features of the toy, such as sound, functional control of the LED intensity, color temperature, color, illumination duration and timing. Such circuitry also controls various other features when the device 10 is secured into other toys, such as control of bubble production for the bubble producing toy 110 shown in Figure 6. In some embodiments, the control of the light patterns of the first and second LEDs 44, 46, and/or other LEDs present is random or regular, or they are controlled in continuous sequence or pattern, a custom sequence or pattern, and/or sequence or pattern that incorporates constant timing, variable timing, and/or dimming.

[0014] As shown in Figure 11, in one embodiment, electrically connected to the microcontroller unit 50 via wiring 41 is a speaker 62 other audio device, and/or a vibrating device. The microcontroller unit 50 further includes an amplifier 90, a receiver 91 a relay 92 and a media player 93. Accordingly, such circuitry also includes control modulation such as, for example, frequency or amplitude modulation.

[0015] As shown in Figures 2 and 11, the microcontroller unit 50 includes a switch 54 and/or another circuit activating or deactivating the device. The switch 54 or other circuit for activating or deactivating the device 10 is mechanical, such as a toggle switch, depression switch, multi-position switch, such as a three-position switch and other similar mechanical activation assemblies. In one embodiment, the switch or other circuitry incorporates activation through embedded instructions and or receipt of activation signals received by the circuitry. For example, the microcontroller 50 includes a receiver 91 for receiving signals which activate the illumination, sound or vibrational features of the device and/or other features of the device 10. The switch 54 or other circuit, for example, incorporate proximity detection devices, such as for example RFID or other types of electronics which sense location, proximity or other wireless instructions which indicate and/or instruct illumination, sound and/or vibrational activation. Such device, for example, include instructions and circuitry operable to detect location in respect to a transmitted beacon. For example, the device automatically activates upon nearing a display, feature, attraction or other location within an amusement park which is transmitting a unique beacon which, when received by the device, causes the device 10 to illuminate and/or play sound and/or activate in a predetermined manner.

[0016] Moreover, the device 10 includes a sound chip and/or media player 93, that includes various prerecorded or preprogrammed sounds or audio or video files. These sounds are preprogrammed with the illumination of the LEDs 44, 46 so that when the device 10, for example, nears a display, the prerecorded sound plays from the speaker and the LEDS 44, 46 illuminate accordingly so that the animation appears to be talking and blinking. Other automated instructions are further implemented such as emitting colors, playing predefined audio stored in memory of the device or received by the receiver of the device, playing signals which are streamed and received by the integrated receiver, and similar functionality. For example, the device 10 includes a proximity detection which includes a blu-tooth beacon receiver. Upon receipt of a unique beacon signal, the device 10 is programmed by instructions stored in memory to activate in a particular manner and/or play specific prerecorded or streamed audio signals, which are programmed with illumination of the LEDS 44, 46 so that the mouth appears talking in synchronization with the song or sound playing. Alternatively, the device 10 incorporates RFID detectors wherein the device 10, upon recognition of a specific RFID signal, begins emitting a predetermined sequence of signals. Other implementations may be implemented such as GPS location detection and determination.

[0017] The illumination of the first and second LEDs 44, 46 and/or other LEDs present within the device 10 are independently activated and/or illuminated via sound activation. For example, when the microphone 56 detects sounds, it transmits this signal to the PCB 42 and activates the LEDs 44, 46 to move via ambient sound detected in the environment. The integrated chip 52 controls the LEDs 44, 46 and coordinates the lights to the ambient sound detected. Furthermore, the sound activation is via the speaker 62, which plays audio and/or sound that is

stored in a sound chip within the device. The microphone 56 is activated by the sound played through the speaker 62, which initiates the sound activated illumination of the LEDs 44, 46. In addition, the speaker 62 may have prerecorded or programmed songs or audio to which the LEDs 44, 46 are preprogrammed to illuminate. Accordingly, the device 10 animates in synchronization with the sound played through the speaker 62. Further, with the switch 54 being multi-way switch, one mode option for the device 10 includes the microphone 56 turned off, which the speaker 29 is on. The light animation function of the LEDs 44, 46, such as the second LED illumination, is preprogrammed to play in accordance with the sound file.

[0018] For example, in use, the switch 54 is a multi-way switch, for example a two-way switch. When a user pushes the switch 54 and/or when the switch 54 is remotely activated, the first LED 44 that is secured within the first chamber 38 remains constantly illuminated. Therefore, the portion of the first image 29 that is illuminated via the first chamber 38, i.e., the eyes and top portion of the mouth are constantly illuminated. The second LED 46 secured within the second chamber 40 is not constantly on and is programmed to be sound activated via the circuitry of the microcontroller unit 50 and the PCB 42. The sound activation is either through diction through the microphone 56 via ambient sounds and/or sounds emanated from the speaker 62 or via programmed sequences. Therefore, the portion of the first image 29 that is illuminated via the second chamber 40, i.e., bottom portion of the mouth illuminates on and off, so the mouth appears to be talking in synchronization with a sound (see the first animation image 12 in Figure 4a in comparison to the second animation image 14 in Figure 4b). The a illumination of the first and second LEDs 44, 46 should not be construed as limiting as they can both activate and deactivate depending on signals received from the PCB 42. For example, the first LED 44 illuminate so the device 10 appears to be blinking.

[0019] If the switch 54 is for example a three-way slide switch, when the switch 54 turned to right it is in an infrared mode. The device 10 receives a signal from a transmitter(s) to unlock an audio file stored within a sound chip in the device 10. There are several audio files stores, for example five, which are prerecorded and preprogrammed in the sound chip. When the user interacts with a transmitter, it unlocks a specific stored audio, which activates the illumination of the LEDs (44, 46) and/or other LEDs of the device 10 in a preprogramed way so that the device is animated to talk in sync with the sound or audio. The microphone 56 is turned off, so the LEDs 44, 46 react to prestored audio and the second LED 46 flashing or illuminating sequence is pre-programmed according to each audio file to create talking animation. Advantageously, the device 10 appears to be talking or singing a song as the microphone 56 is turned off, so it is not sound activated by any environmental noises. When the switch 54 is turned to the left, the microphone 56 is active, so the illumination of the LEDs 44, 46 is sound activated by environmental noises. Further, in one embodiment, the device 10 includes numerous other LEDs within the device 10, so in addition to the talking animation, there is a unique light show that is activated when a user holds down the switch 54. In one exemplary embodiment, the device 10 further includes a push button, which unlocks the stored memory feature of the device, which replays and cycle through unlocked audio file.

[0020] In another exemplary embodiment, for example, in addition to the switch 54, the device 10 includes a button and various LEDs in addition to the first and second LEDs 44, 46. When the user presses the button, the light, sound and projection of the device is automatically activated. Continuously pressing of button cycles through a variety of different light effects, projection and sound effects (see flow chart of Figure 10). The effects automatically turn off after flashing through the different effects. In addition, anytime the user presses the button for a set period or time, for example, around three seconds, the mode of the device 10 changes. For example, the colors or the LEDs 44, 46 change, or the microphone turns off, etc.

[0021] In one embodiment, the device 10 includes an interactive hub containing a walkie talkie. The microphone of the walkie talkie picks up the sound emitted from a nearby smart device, which is encoded onto a radio frequency and transmitted via an antenna of the walkie talkie to a walkie talkie that is secured within a toy. This signal is decoded from the radio signal and drives a speaker within the toy. The toy further includes a microphone, which detects the sound and sends a signal to an integrated circuit, which controls the illumination of various LEDs 44, 46 secured within the toy. The LEDs 44, 46 illuminate in synchronization with the sound to animate a face on a surface of the toy, so the toy appears to be talking.

[0022] Advantageously, the device 10 is easily secured into or onto anything. For example, as shown in Figures 4a-6 and 9, the device 10 is bracketed inside further enclosures 100, 101, 114. This enclosure 100, 101, 114 is for example made of a thermal plastic material such as acrylonitrile butadiene styrene and is around about 50-80% opacity, preferably about 70% opacity. This enclosure 100, 101, 114 is white or beige to better reflect the images produced by the illumination of the film 28. This opacity is ideal as it reflects the ideal amount of light onto the inner surface of the enclosure 100, 101, 114 and allows light to project therethrough, so the animated image is visible. The image cut on the film 28 magnifies when illuminated so the image 29 appears larger than the size of the film 28 when it is projected onto an inside surface of the enclosure 100, 101, 114. Moreover, to aid in producing a desired animation effect, the enclosure 100, 101, 114 includes a silhouette 105 of a face, for example, onto which the illumination through the film projects and is magnified. This advantageously creates the illusion of a larger face, than is the size of the smiley

face present on the film 28. Further, as shown in Figure 5, the enclosure 100, 101, 114 includes various LEDs 102 that illuminate in coordination with the device to create an animated light show.

[0023] As shown in Figure 9, the device 10 is worn by a user, for instance around their neck via a lanyard 103 or on a wristband. Moreover, in another embodiment, the device 10 includes a magnet secured to the base 21, which is attracted to a free-standing magnet. The device 10 is, therefore, securable around a user's clothing.

[0024] Moreover, as shown in Figure 6, the device 10 is secured into a bubble producing toy 110. The bubble toy 110 is like a bubble producing wand, which is made by Applicant and is disclosed in U.S. Patent Application No. 17/335,447, which application is incorporated by reference herein in its entirety. In this embodiment, there is for example, a three-way slide switch 111 behind a handle 112 to change the mode. When the switch 111 is turned to the right, bubbles are emitted out of the top of the toy 110 and the device 10 illuminates to create an animation that is projected onto an inner surface of a globular housing 114. There is a separate push button 116 beside the 3-way slide switch which plays and stops music. The mouth of the device 10 animates and accompanies the music or in sync with the music. When the music stops, the light show returns to a preprogrammed light show. When the slide switch 111 is turned to the left, other functions are activated, and the animation of the mouth is triggered by external soundwaves.

[0025] Moreover, as shown in figure 7, the device 10 is secured into a balloon toy 200. In this embodiment, a back side of the inflatable balloon 210 is printed with foil or a reflective material, while a front side of the balloon is left blank to allow for precise projection of the animated images. A button 212 is located on a handle 214 of the toy. When this button 212 is pressed, the light, sound, and projection features of the toy 200 are automatically activated. Continuously pressing of the button 212 cycles through six different light effects, projection and sound and automatically turn off after flashing all the different effects (see flow chart of Figure 10). When the button 212 is pressed for a certain amount of time, such as about 3 seconds, the mode changes, and the animation features deactivate, for example on the shaft 218 of the toy 200. Instead, various LEDS 216 light the inside the inflatable balloon illuminate the surface of the balloon. Continuously pressing of the button 212 changes the color and luminosity of the LEDs 216. After flashing the preprogrammed color sequence, the toy 200 turns off automatically. Moreover, the handle 214 incudes an IR signal button 219, which sends an IR signal for a fixture or a toy.

[0026] As shown in Figure 8, the device 10 is securable into a plush toy 300. In this embodiment, the plush toy 300 includes a projection box 302, which is a closed box that contains the animated device 10 and an image is stitched around the toy's 300 projection opening. Further the plush toy 300 includes a cut-away 304 on the plush toy into which the projection box 302 is secured.

[0027] In one embodiment, the animation effect is created differently. For example, the film 28 is a much thicker material, so that you can only see the mouth as a light. Accordingly, light is used to create shadows, which create the animation.

[0028] It is well recognized by persons skilled in the art that alternative embodiments to those disclosed herein, which are foreseeable alternatives, are also covered by this disclosure. The foregoing disclosure is not intended to be construed to limit the embodiments or otherwise to exclude such other embodiments, adaptations, variations, modifications and equivalent arrangements. The embodiments may be combined.

[0029] The invention also concerns any one of the foregoing described toys, particularly comprising the device according to any one of the foregoing described embodiments.

[0030] The invention may also be described by the following clauses:

Clauses:

[0031]

1. An illuminating animation device comprising:

    a housing comprising a base and a film secured together via a wall that extends therebetween, which forms a housing compartment, wherein the film includes an image cut therein;

    a divider secured within the housing compartment, which divides the compartment into a first and second chamber;

    a printed circuit board secured to the base within the compartment, wherein the printed circuit board comprises a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber;

    a microcontroller unit secured to the base and electrically connected to the printed circuit board, wherein the microcontroller unit comprises a microphone; and

    a power source electrically connected to the microcontroller unit.

2. The device of clause 1, wherein a bracketing system is secured to an outside surface of the wall.

3. The device of clause 1, wherein the image is a smiley face, and the divider is curved to correspond with the u-shape of the mouth so that the eyes and an upper portion of the mouth are illuminated by the first LED and a lower portion of the mouth are illuminated by the second LED.

4. The device of clause 1, wherein the first LED is continuously illuminated when the device is powered on.
5. The device of clause 1, further comprising a speaker secured to the base and electrically connected to the microcontroller unit.
6. The device of clause 1, wherein the device is affixable to a lanyard.
7. The device of clause 1, further comprising at least one additional LED secured within the compartment and electrically connected to the microcontroller unit.
8. The device of clause 1, wherein the microcontroller unit further comprises a receiver for remote activation of the device.
9. The device of clause 1, wherein the illumination of the first and second LED are sound activated via sound detected by the microphone.
10. An illuminating animation device comprising:
an enclosure comprising:
a housing secured therein comprising a base and a film secured together via a wall that extends therebetween, which forms a housing compartment, wherein the film includes an image cut therein;

a divider secured within the housing compartment, which divides the compartment into a first and second chamber;

a printed circuit board secured to the base within the compartment, wherein the printed circuit board comprises a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber;

a microcontroller unit secured to the base and electrically connected to the printed circuit board, wherein the microcontroller unit comprises a microphone and a switch; and

a power source electrically connected to the microcontroller unit.

11. The device of clause 10, wherein the opacity of the enclosure is about 50-80% opacity, preferably about 70% opacity.
12. The device of clause 10, wherein the image is a smiley face and the divider is curved to correspond with the u-shape of the mouth so that the eyes and an upper portion of the mouth are illuminated by the first LED and a lower portion of the mouth are illuminated by the second LED.
13. The device of clause 10, wherein the first LED is continuously illuminated when the device is powered on.
14. The device of clause 10, further comprising a speaker electrically connected to the microcontroller unit, wherein the illumination of the first and second LED are sound activated via sound detected by the microphone from the environment or the speaker.
15. The device of clause 10, wherein the microcontroller unit further comprises a receiver for remote activation of the device.
16. The device of clause 10, further comprising at least one additional LED secured within the compartment and electrically connected to the microcontroller unit.
17. An illuminating animation device comprising:
an enclosure comprising:
a housing secured therein comprising a base and a film secured together via a wall that extends therebetween, which forms a housing compartment, wherein the film includes a smiley face image cut therein;

a divider secured within the housing compartment, which divides the compartment into a first and second chamber;

a printed circuit board secured to the base within the compartment, wherein the printed circuit board comprises a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber, wherein the divider is curved to correspond with the u-shape of the mouth so that the eyes and an upper portion of the mouth are illuminated by the first LED and a lower portion of the mouth are illuminated by the second LED;

a microcontroller unit secured to the base and electrically connected to the printed circuit board, wherein the microcontroller unit comprises a microphone and a switch;

a speaker electrically connected to the microcontroller unit; and

a power source electrically connected to the microcontroller unit.

18. The device of clause 17, wherein the first LED is continuously illuminated when the device is powered on.
19. The device of clause 17, wherein the illumination of the first and second LED are sound activated via sound detected by the microphone from the environment or the speaker.
20. The device of clause 17, further comprising at least one additional LED secured within the compartment and electrically connected to the microcontroller unit.

[0032] In summary, the invention concerns a device that creates animation via the illumination of various

LEDs through a film into which an image is cut. The film includes an image cut therein. The device includes a housing with a housing compartment formed by the film connected to a base via a wall. Secured within the housing compartment is a divider, which divides the compartment into a first and second chamber. A printed circuit board is secured within the compartment and includes a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber. A microcontroller unit controls the illumination of the first and second LEDs in conjunction with sound either from a microphone or a speaker to animate the image cut into the film.

[0033] Foregoing described methods are preferably carried out by the microcontroller unit and/or other described control circuitry. These are configured to carry out any one or more of steps described in the foregoing embodiments.

Claims

1. An illuminating animation device comprising:

a housing compartment comprising a base and a film secured together via a wall that extends therebetween, wherein the film includes an image cut therein;
a divider secured within the housing compartment, which divides the compartment into a first and second chamber;
a printed circuit board secured to the base within the housing compartment, wherein the printed circuit board includes a first and second LED, wherein the first LED is secured within the first chamber and the second LED is secured within the second chamber;
a microcontroller unit secured to the base and electrically connected to the printed circuit board; and
a power source electrically connected to the microcontroller unit.

2. The device of claim 1, wherein the image is a smiley face with a mouth and eyes, and the divider is curved to correspond with a u-shape of the mouth so that the eyes and an upper portion of the mouth are illuminated by the first LED and a lower portion of the mouth is illuminated by the second LED.

3. The device of claims 1 or 2, wherein the first LED is continuously illuminated when the device is powered on.

4. The device of any of claims 1-3, wherein the microcontroller unit further comprises a microphone.

5. The device of any of claim 4, wherein an illumination of the first and second LEDs is sound activated via sound detected by the microphone.

6. The device of any of claims 1-5, further comprising a speaker secured to the base and electrically connected to the microcontroller unit.

7. The device of claim 6, wherein an illumination of the first and second LEDs are sound activated via sound played from the speaker.

8. The device of any of claims 1-7, wherein the microcontroller unit further comprises a receiver for remote activation of the device.

9. The device of any of claims 1-8, further comprising an enclosure into which the housing is secured, wherein the outside surface of the enclosures includes a bracketing system secured thereto.

10. The device of claim 9, wherein the opacity of the enclosure is about 50-80%, preferably about 70%.

11. The device of claim 9, wherein the bracketing system secures the enclosure within a bubble producing toy.

12. The device of any of claims 1-11, further comprising at least one additional LED secured within the housing compartment and electrically connected to the microcontroller unit.

13. The device of any of claims 1-12, wherein a third LED is secured to the printed circuit board within the first chamber and a fourth LED is secured to the printed circuit board within the second chamber.

14. The use of the device of claim 1 as a device for producing an animation through a film via the programmed illumination of LEDs.

15. A lanyard comprising the device of claim 1 secured thereto.

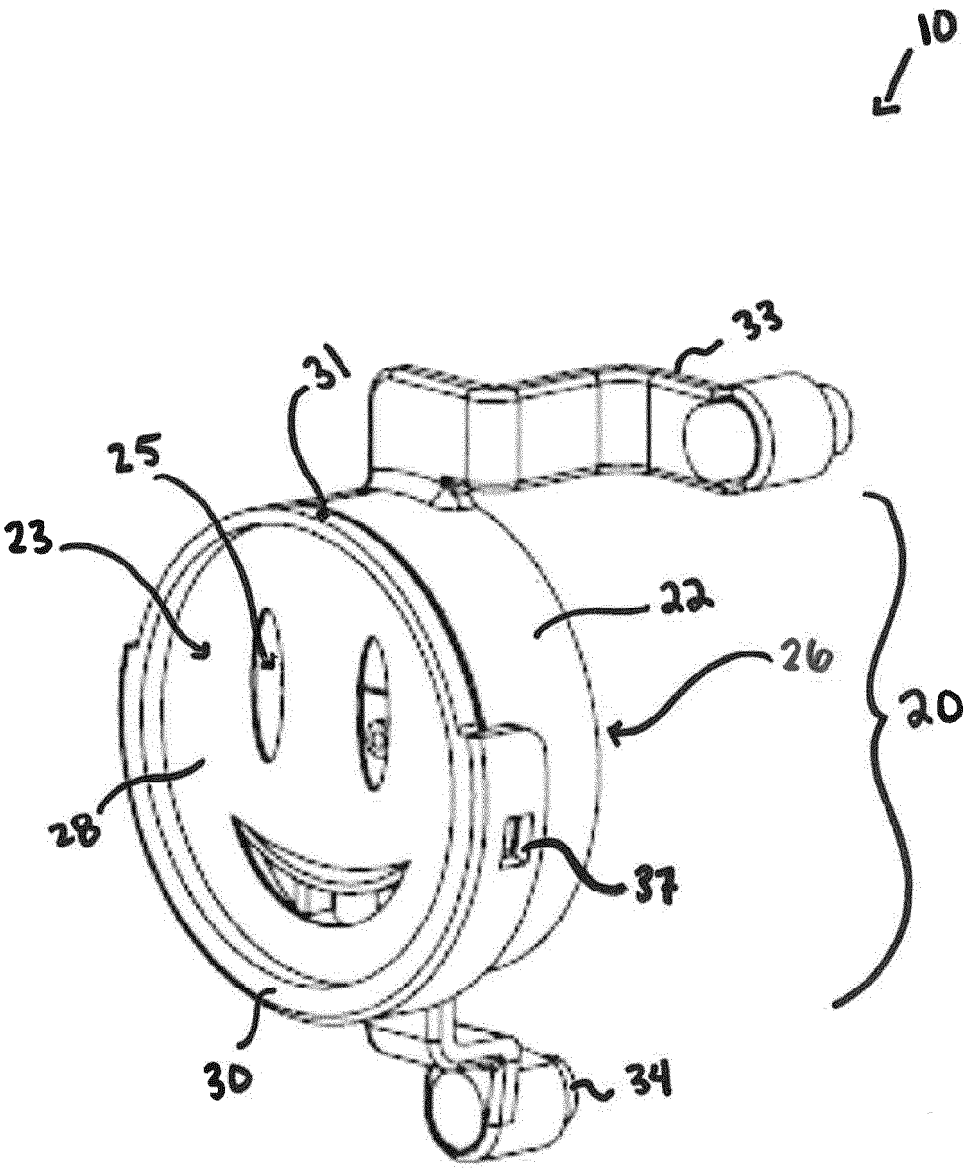

Fig. 1

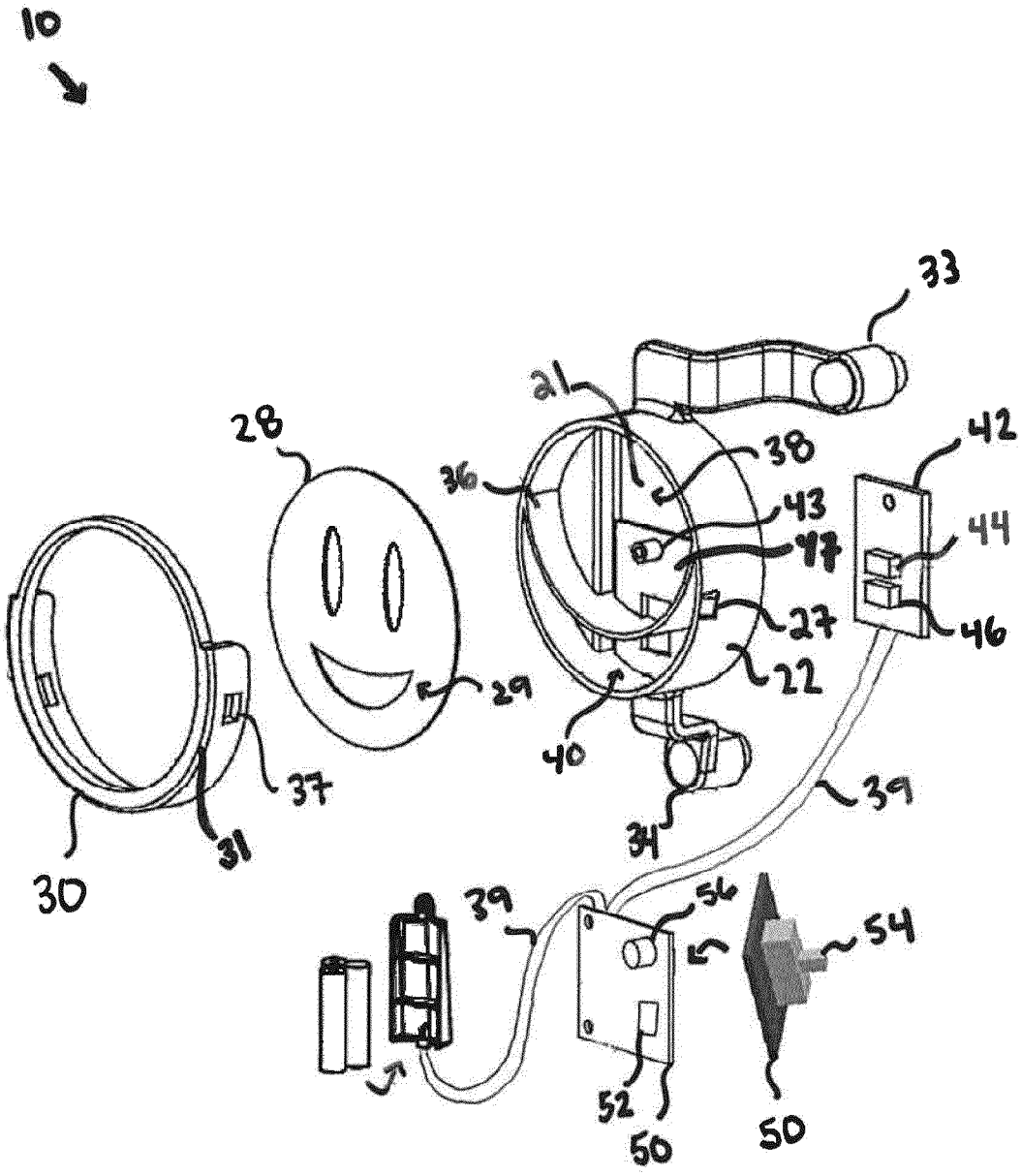
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Fig. 2

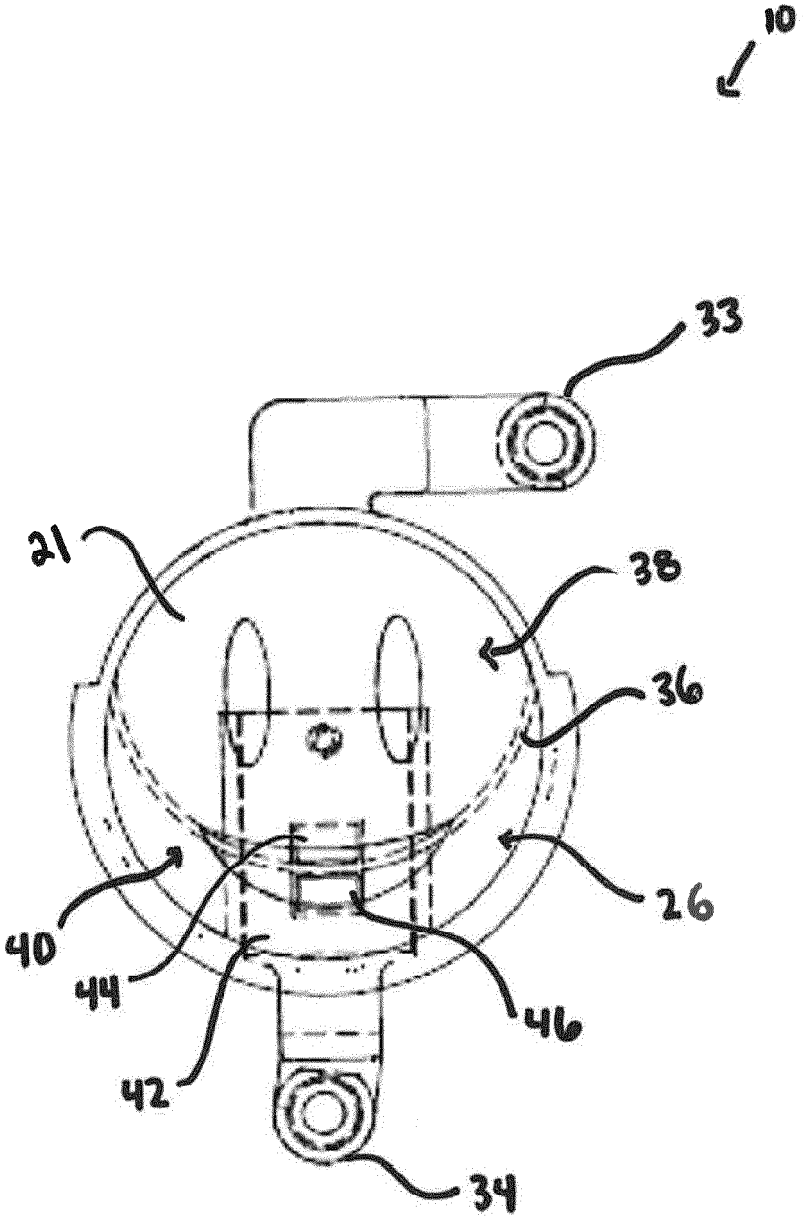

Fig. 3

Fig. 4a

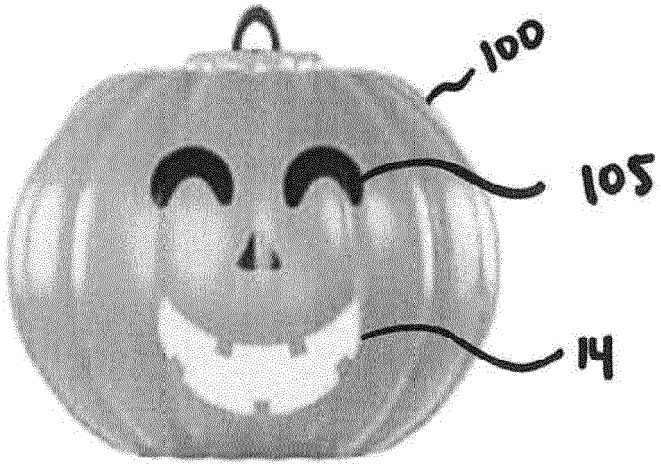

Fig. 4b

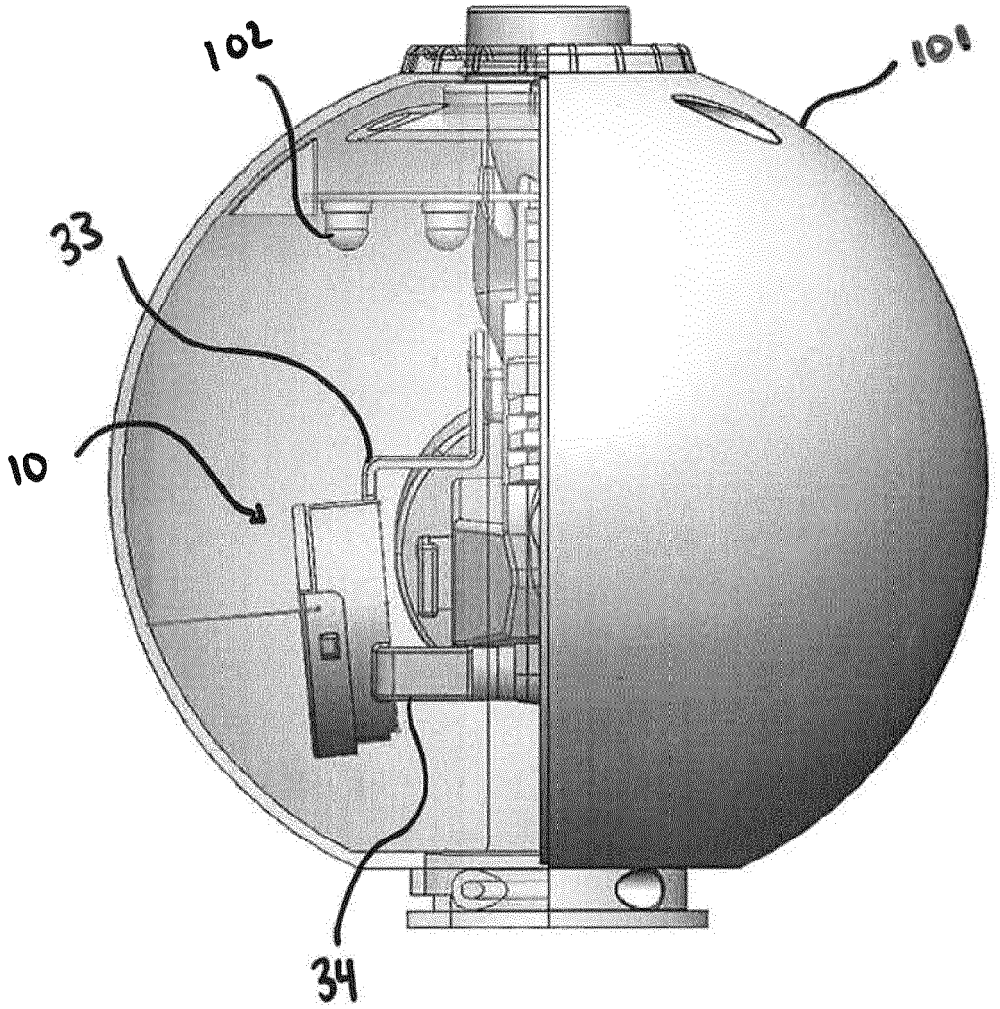

Fig. 5

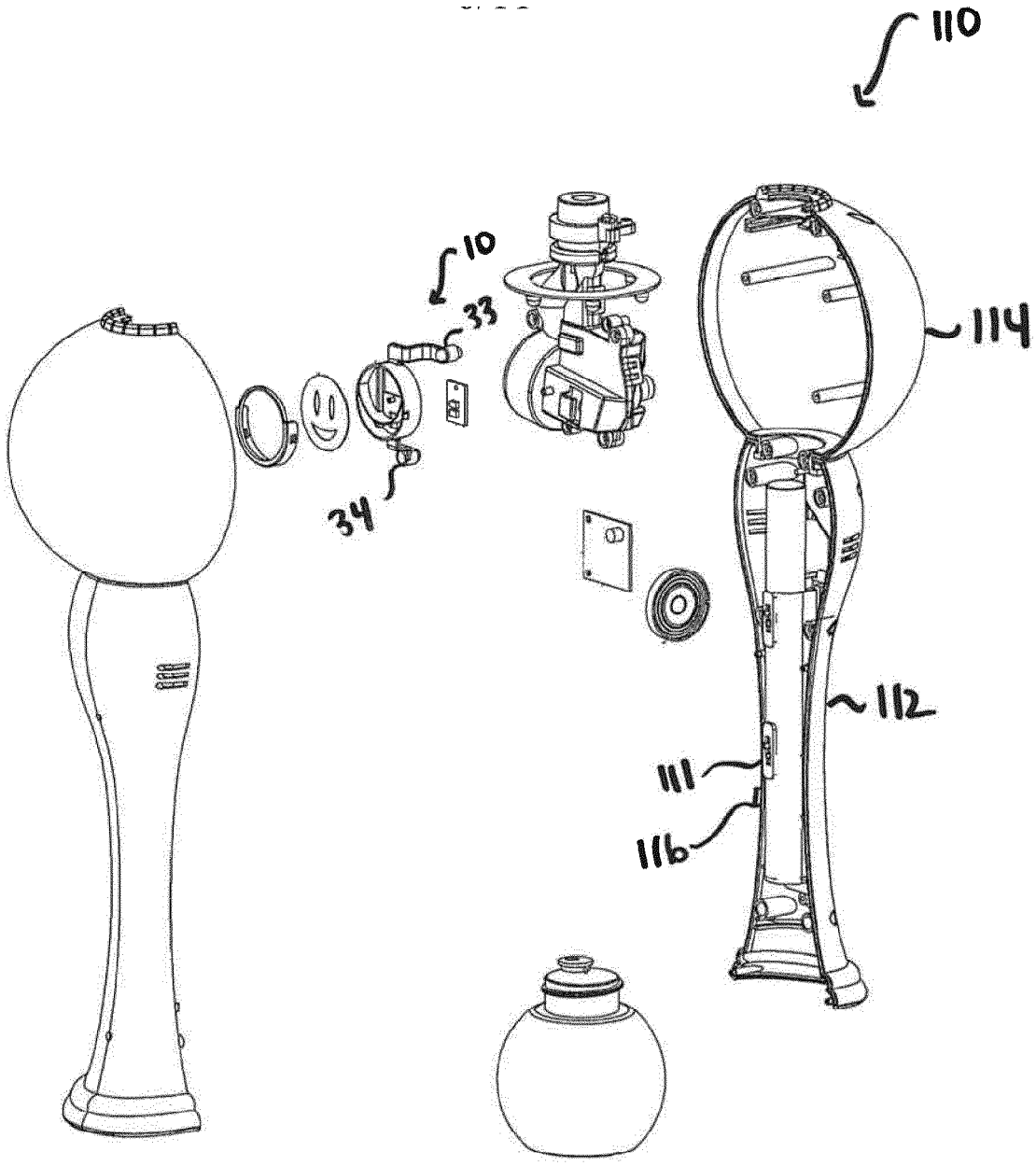

Fig. 6

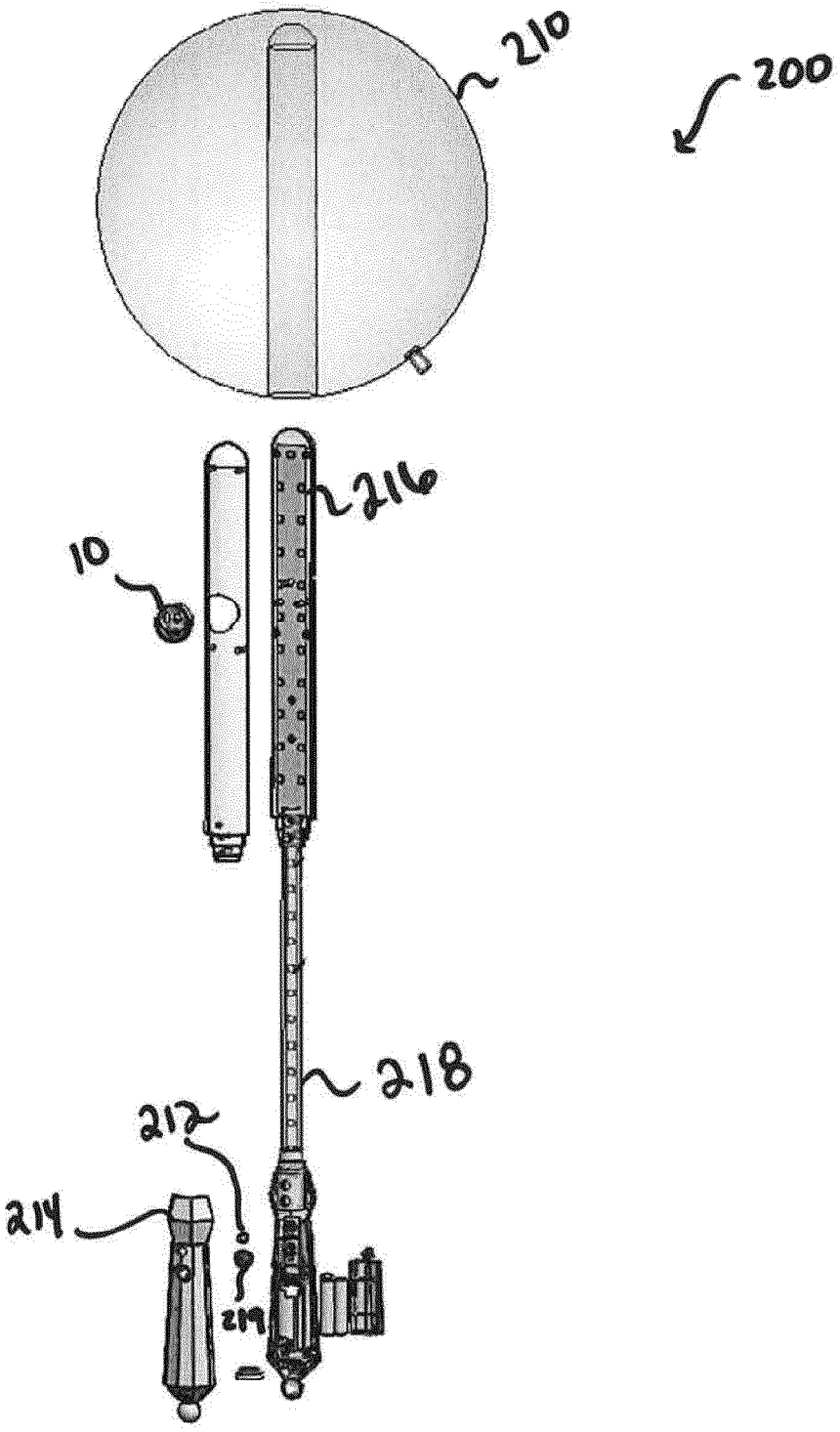

Fig. 7

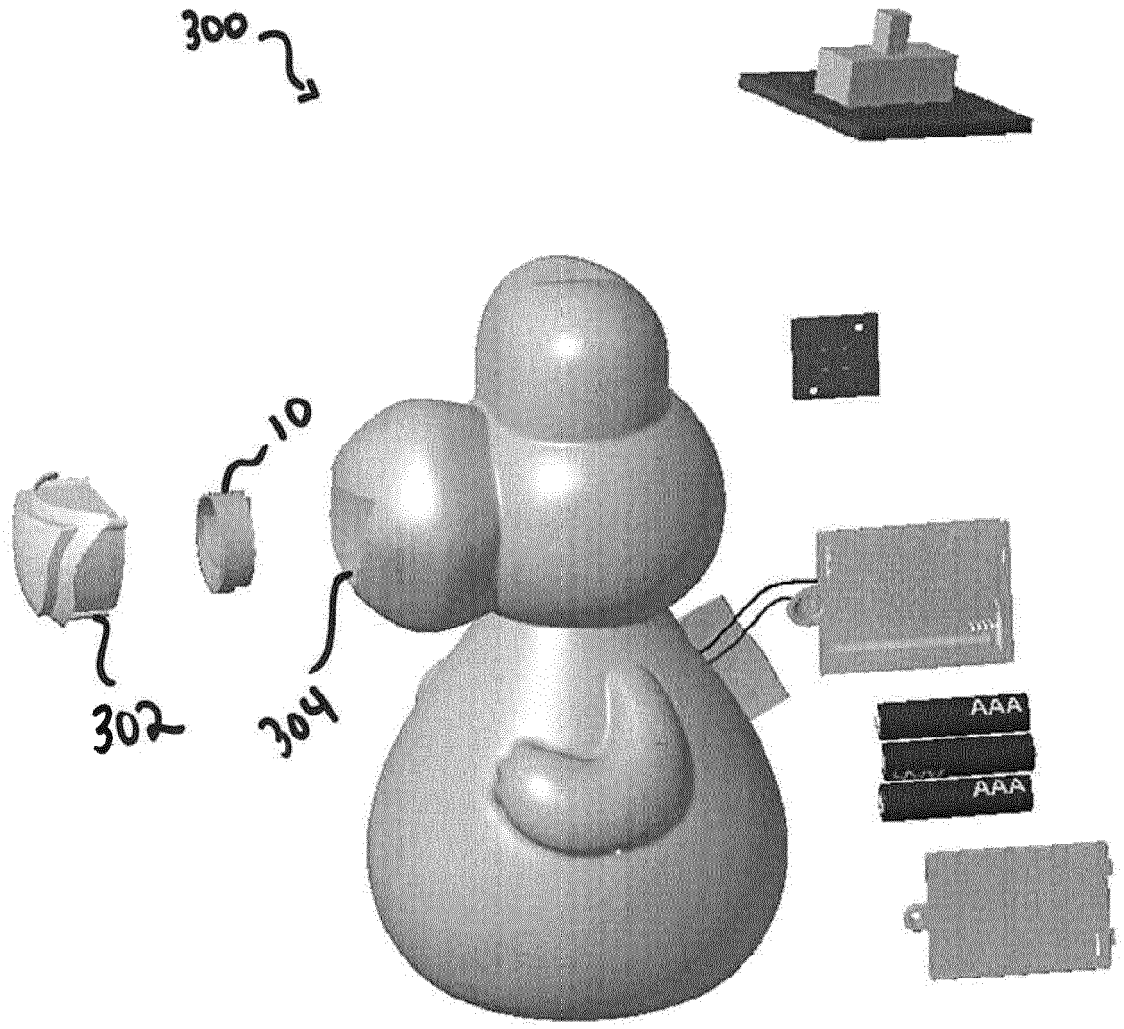

Fig. 8

Fig. 9

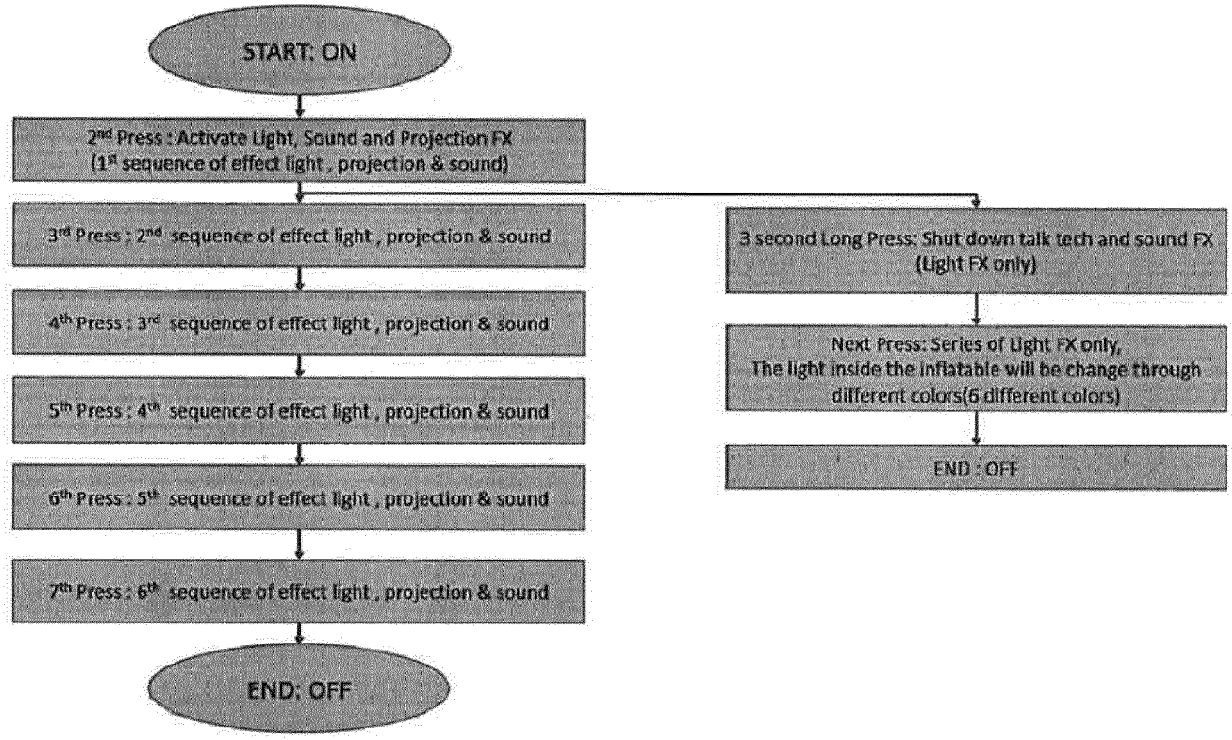
START: ON
2nd Press : Activate Light, Sound and Projection FX (1st sequence of effect light , projection & sound)
3rd Press : 2nd sequence of effect light , projection & sound
4th Press : 3rd sequence of effect light , projection & sound
5th Press : 4th sequence of effect light , projection & sound
6th Press : 5th sequence of effect light , projection & sound
7th Press : 6th sequence of effect light , projection & sound
END: OFF
3 second Long Press: Shut down talk tech and sound FX (Light FX only)
Next Press: Series of Light FX only, The light inside the inflatable will be change through different colors(6 different colors)
END : OFF

Fig. 10

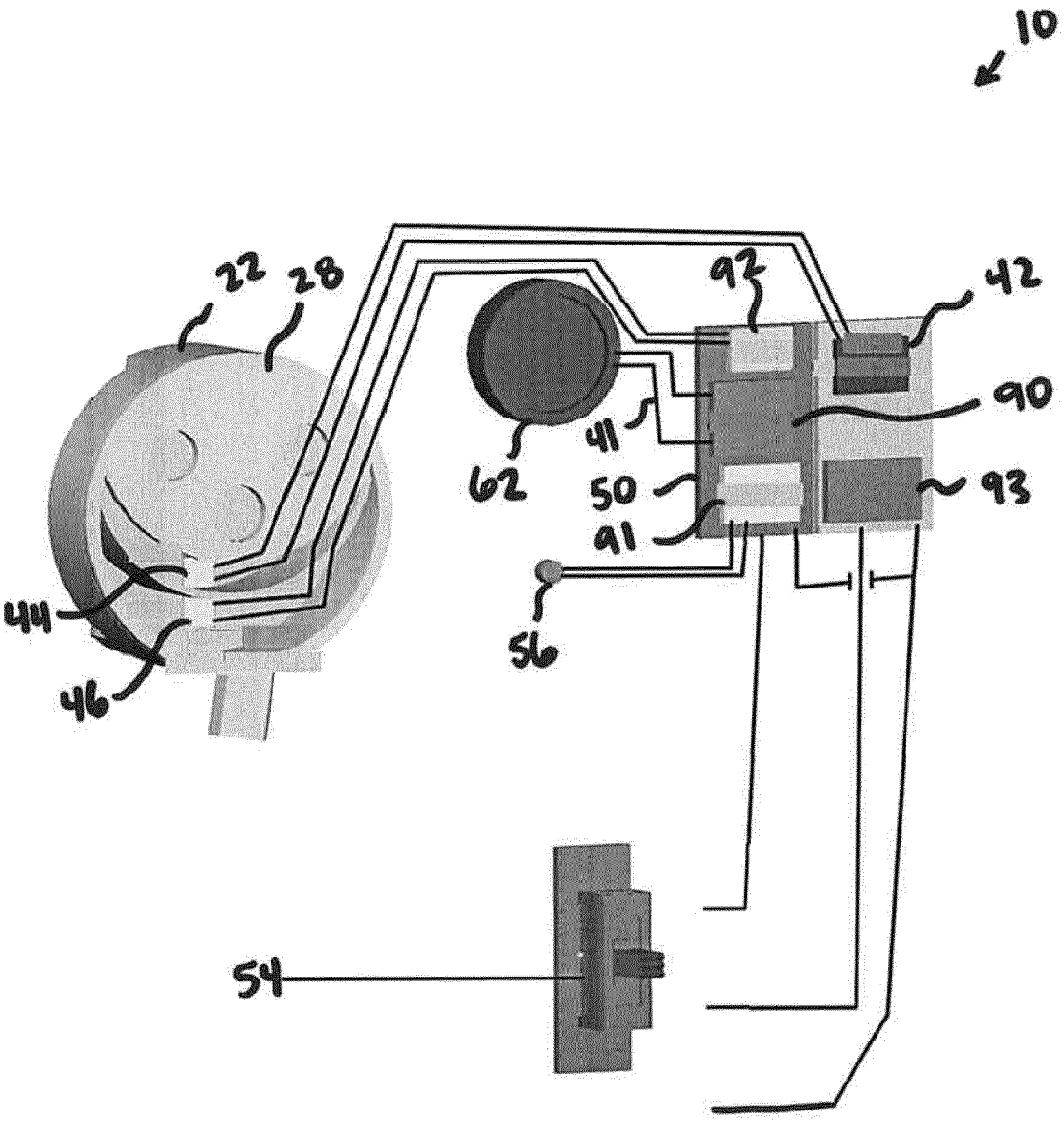

Fig. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 23 20 8476

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2018/224729 A1 (SUM KAN WAH KAN [HK] ET AL) 9 August 2018 (2018-08-09) * paragraphs [0110], [0114], [0117]-[0118], [0121]-[0124], [0126], [0128]; figures 1-28 *	1-15	INV. A63H3/00 A63H3/28 A63H33/22 A63H33/28
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A	WO 2007/084770 A2 (PTI GROUP INC [US]; GRISOFF TODD FRANCIS [US]) 26 July 2007 (2007-07-26) * the whole document *	1-15	TECHNICAL FIELDS SEARCHED (IPC) A63H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 March 2024	Turmo, Robert

CATEGORY OF CITED DOCUMENTS

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08-03-2024

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REFERENCES CITED IN THE DESCRIPTION

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