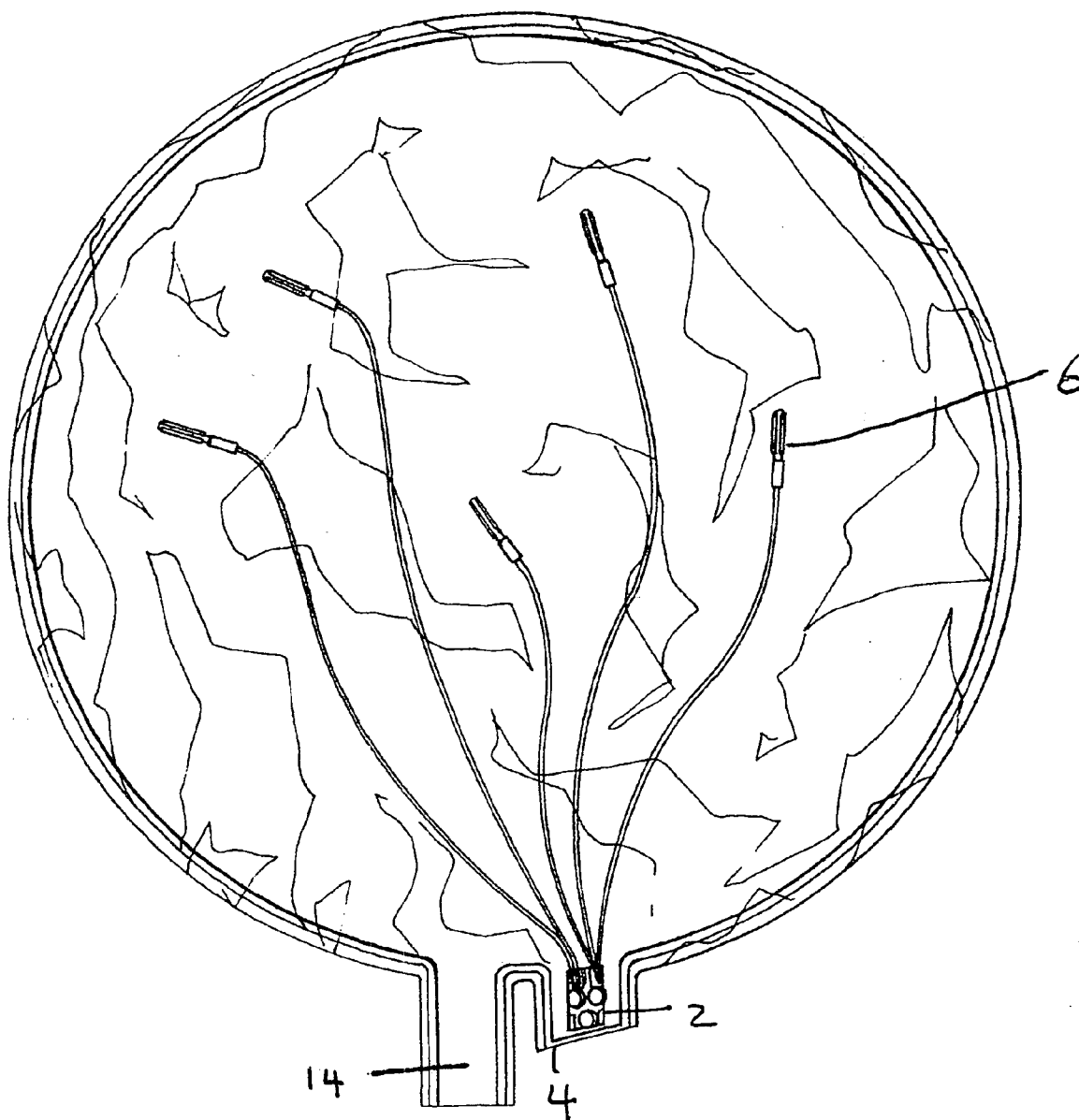




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(19) **United States**(12) **Patent Application Publication**
Rubinstein(10) **Pub. No.: US 2009/0191787 A1**(43) **Pub. Date: Jul. 30, 2009**(54) **LED EMBEDDED BALLOON****Publication Classification**(76) Inventor: **David B. Rubinstein**, Boca Raton,
FL (US)(51) **Int. Cl.**
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BOULDER, CO 80301 (US)(52) **U.S. Cl.** **446/220**(21) Appl. No.: **12/321,811**(22) Filed: **Jan. 26, 2009****Related U.S. Application Data**(60) Provisional application No. 61/062,327, filed on Jan.
26, 2008.(57) **ABSTRACT**

A balloon having superior luminosity comprising an inelastic balloon having LEDs mounted on the inside surface of the balloon is provided. The balloon further comprises a power supply having a manually operated switch mounted on a tab on the periphery of the balloon for accessibility and replacement of the batteries.



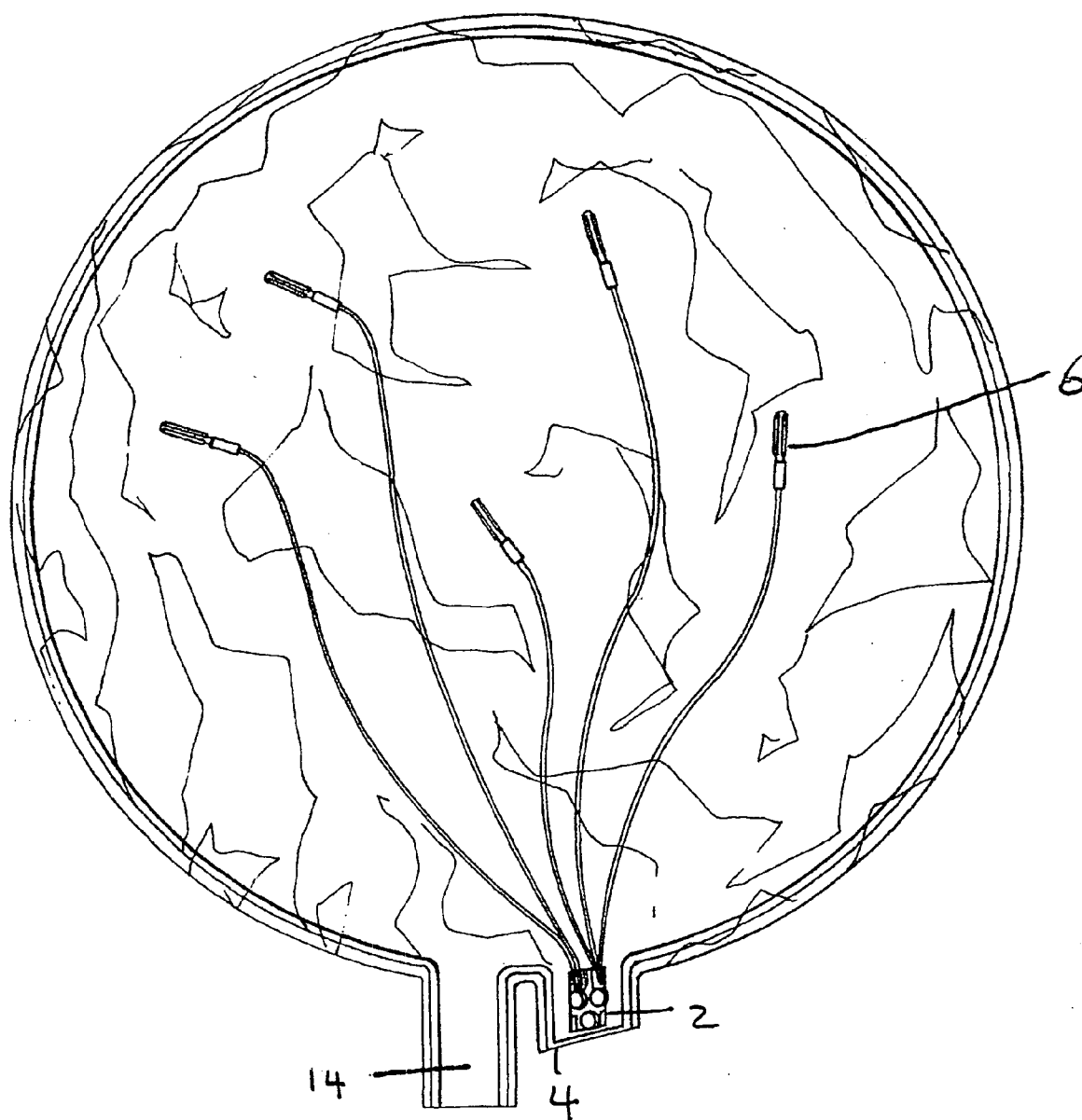


FIG.1

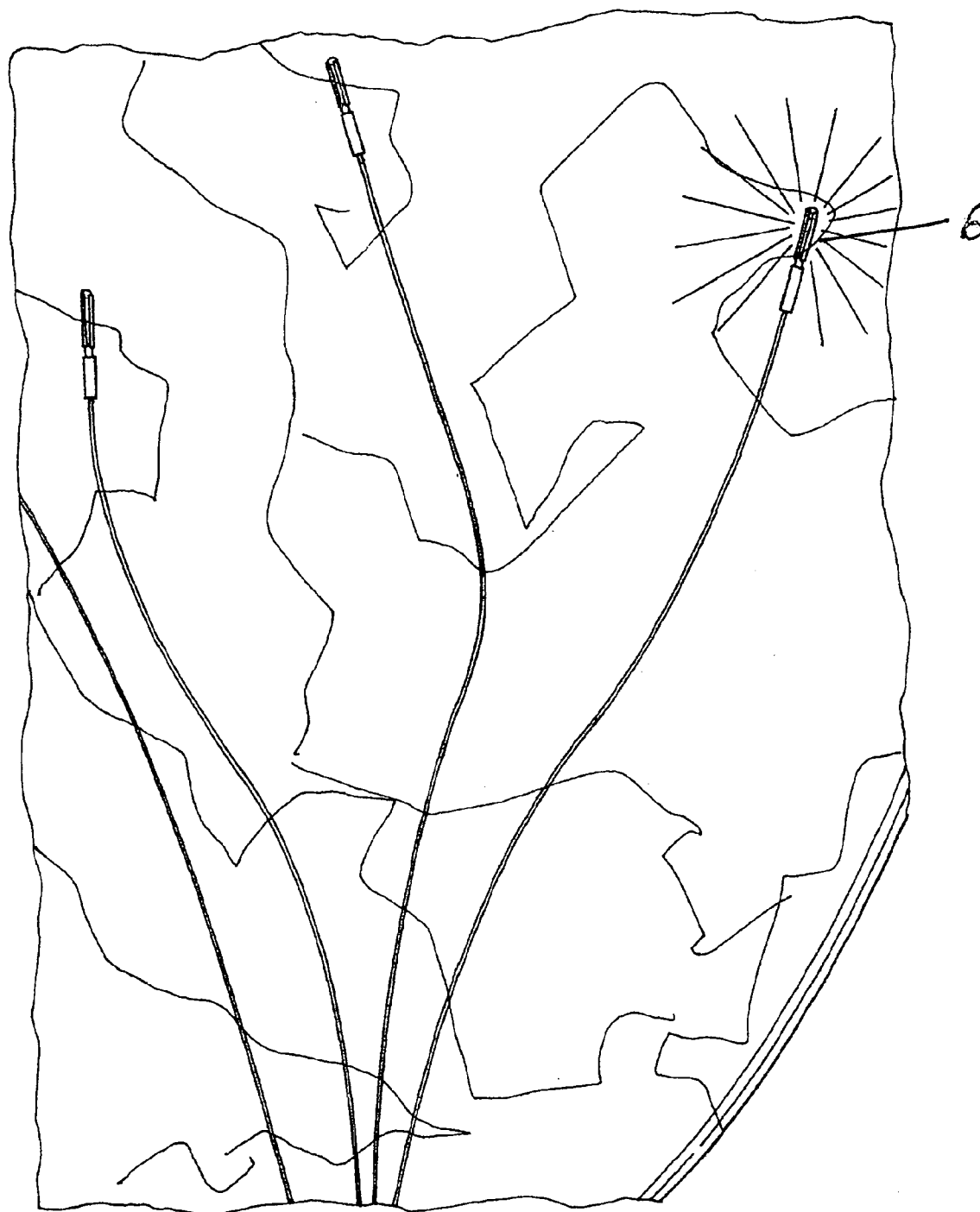


FIG.2

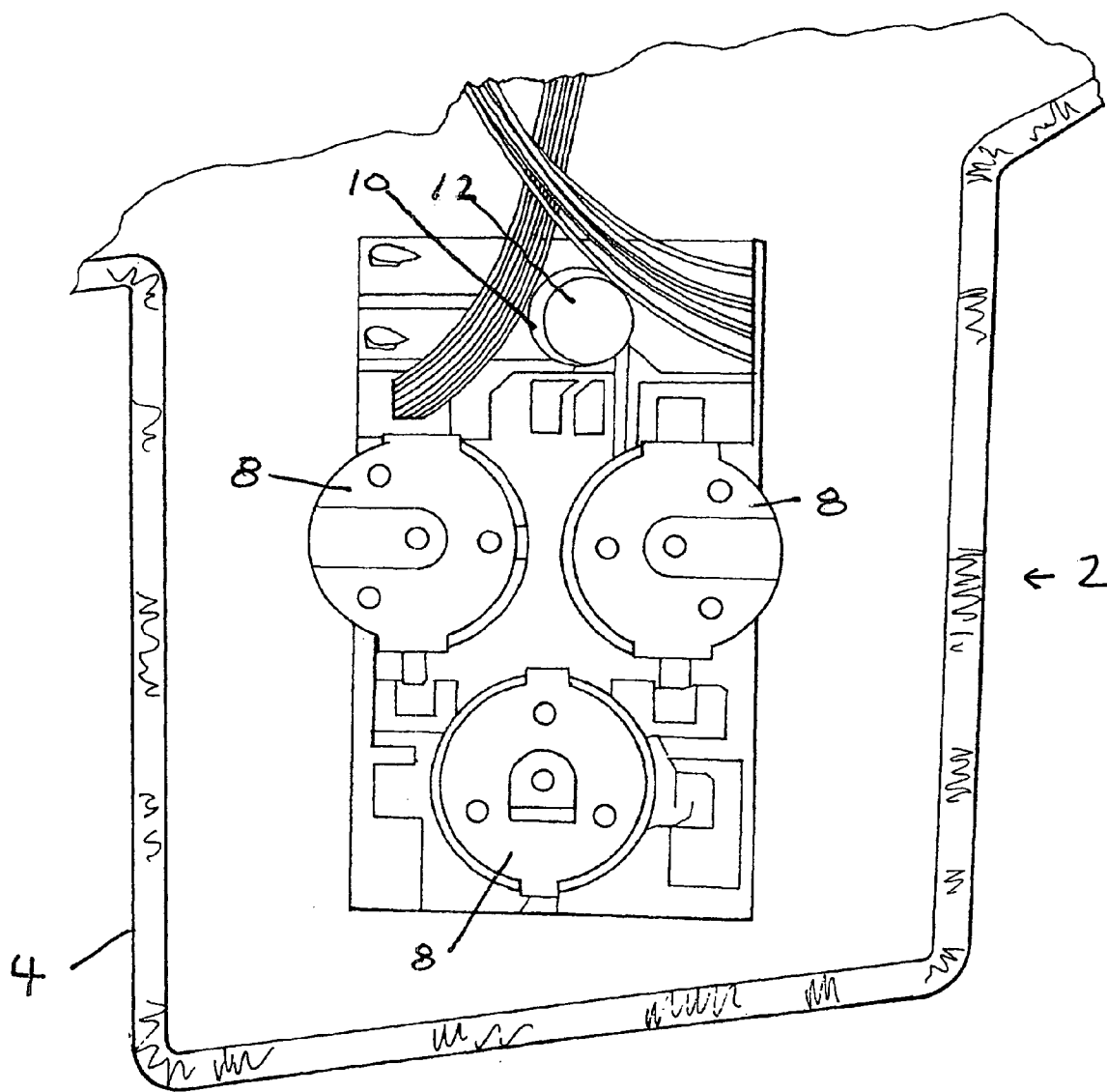


FIG.3

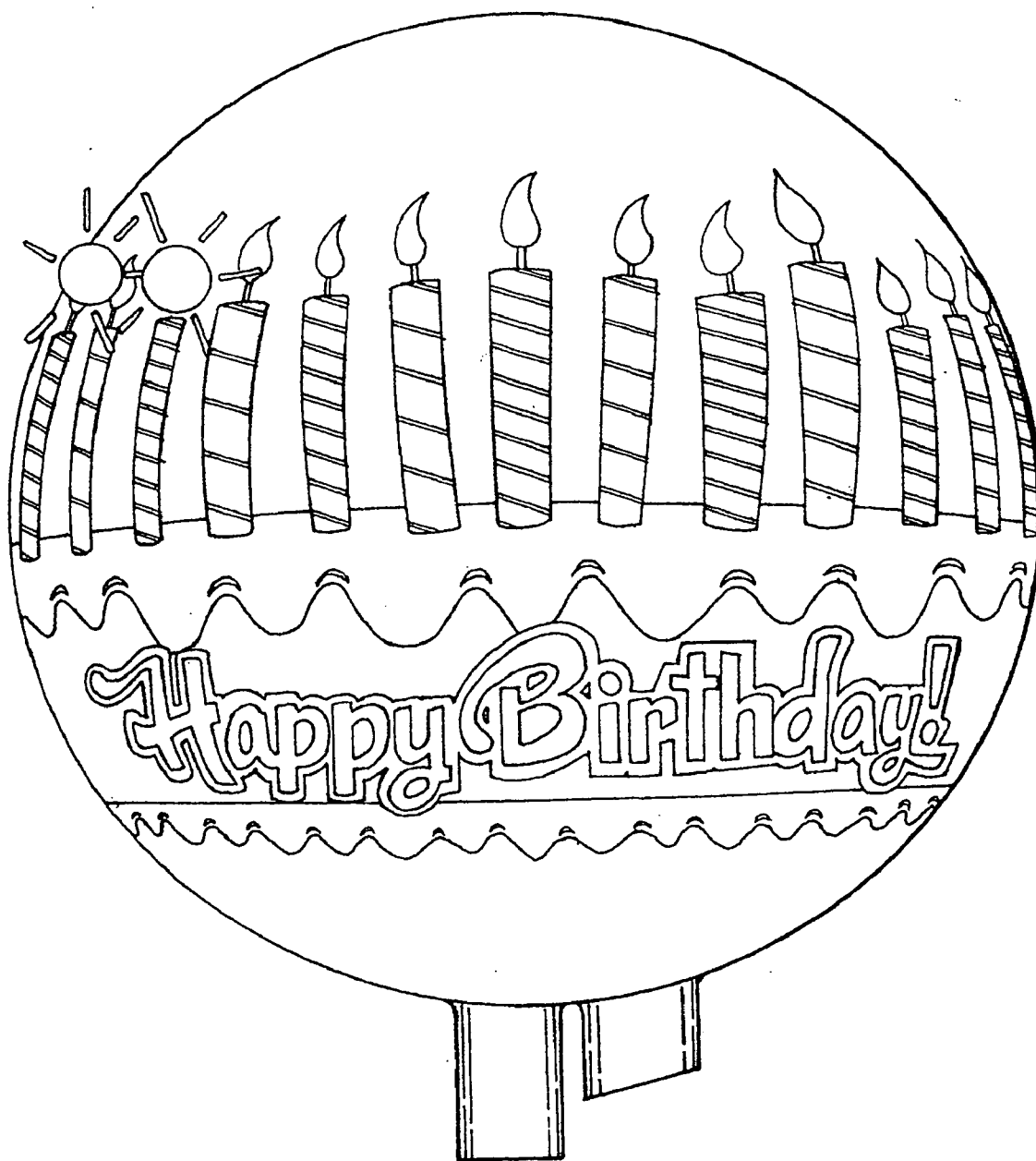


FIG.4

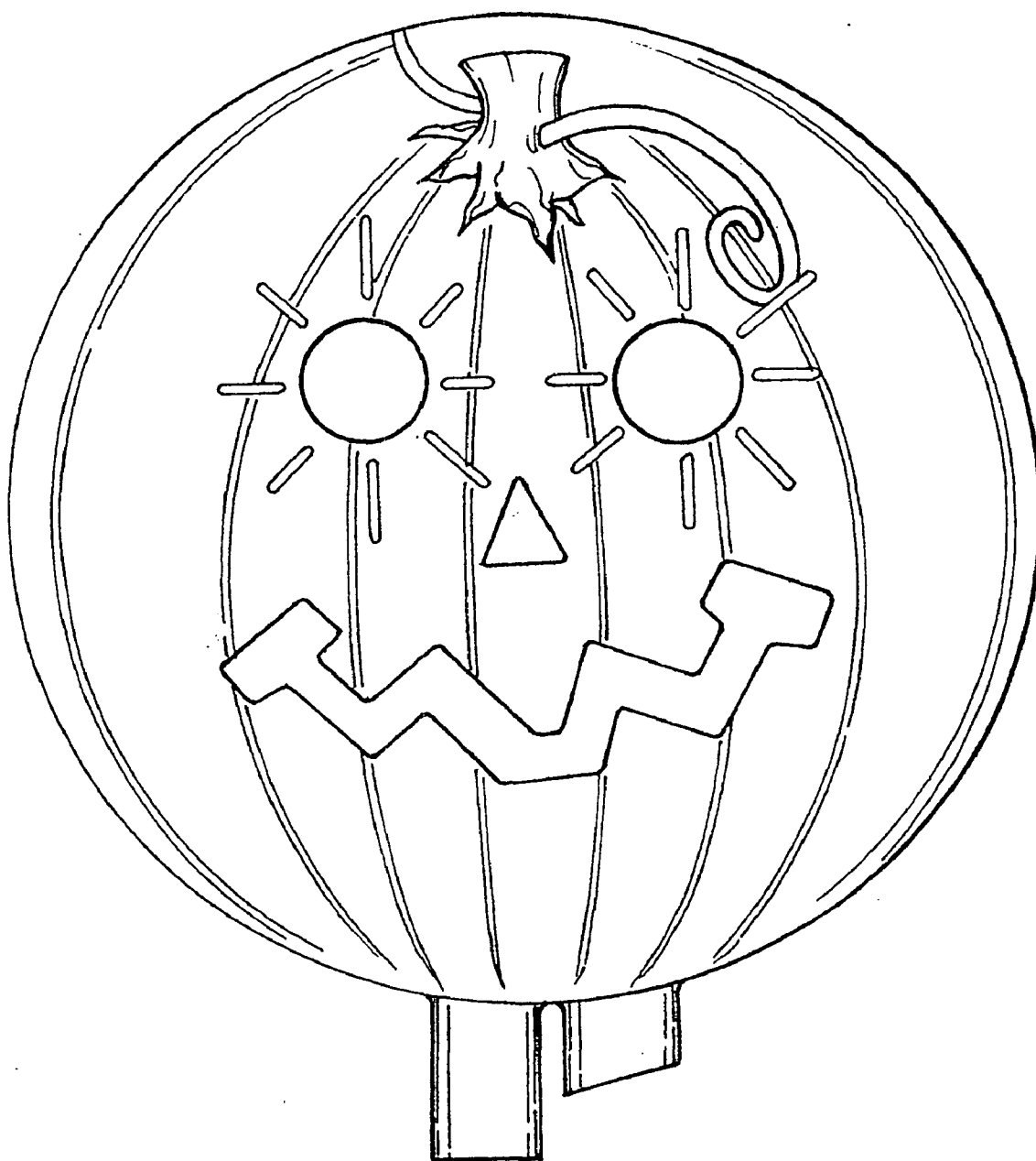


FIG.5

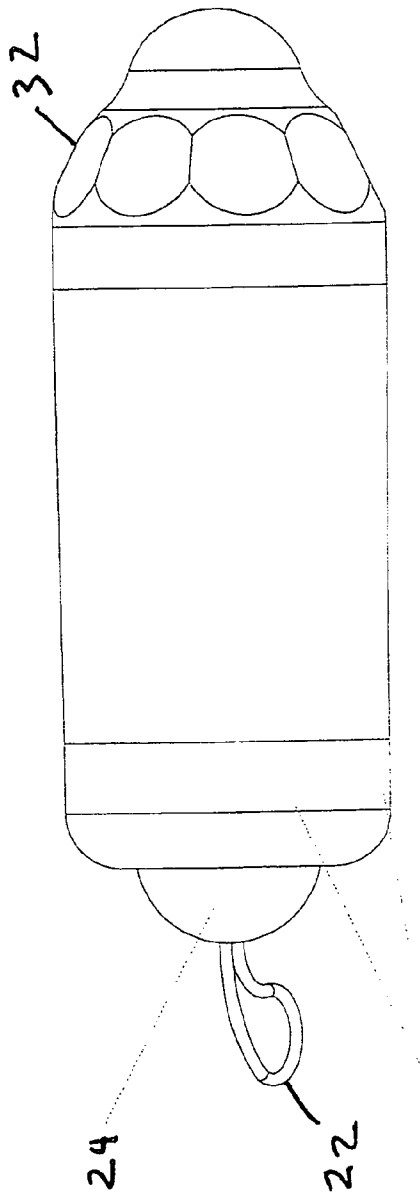


FIG. 6

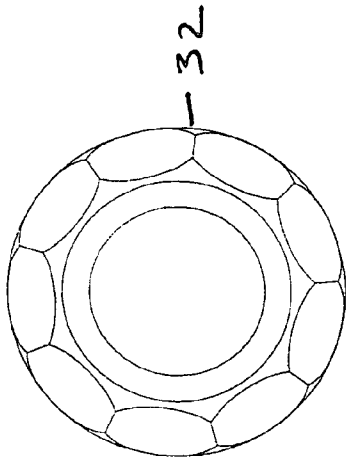
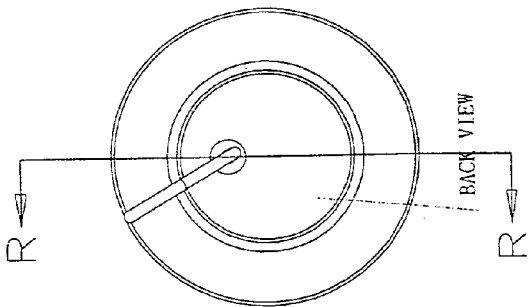
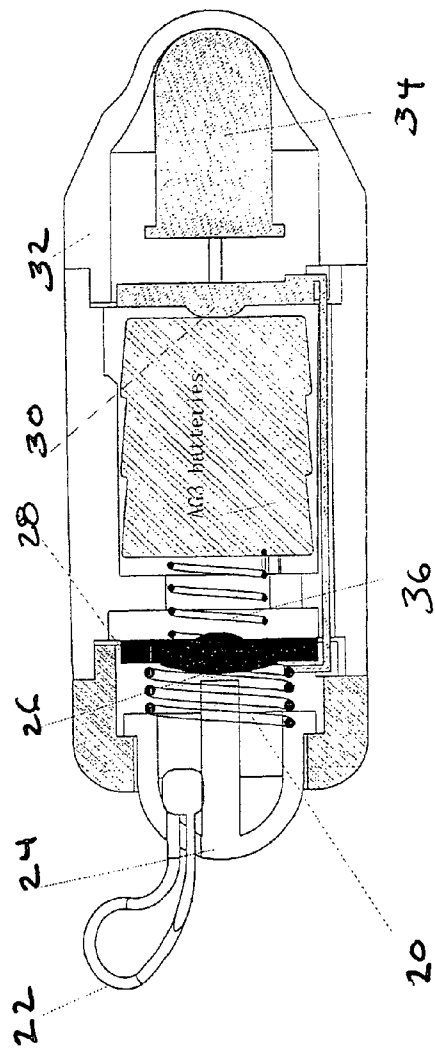


FIG. 7



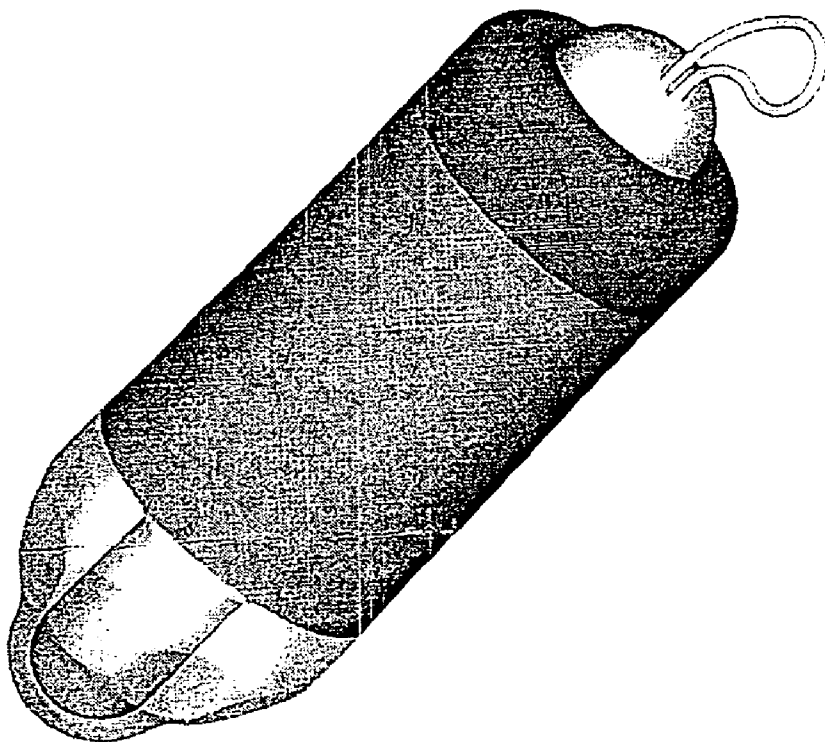


FIG. 10

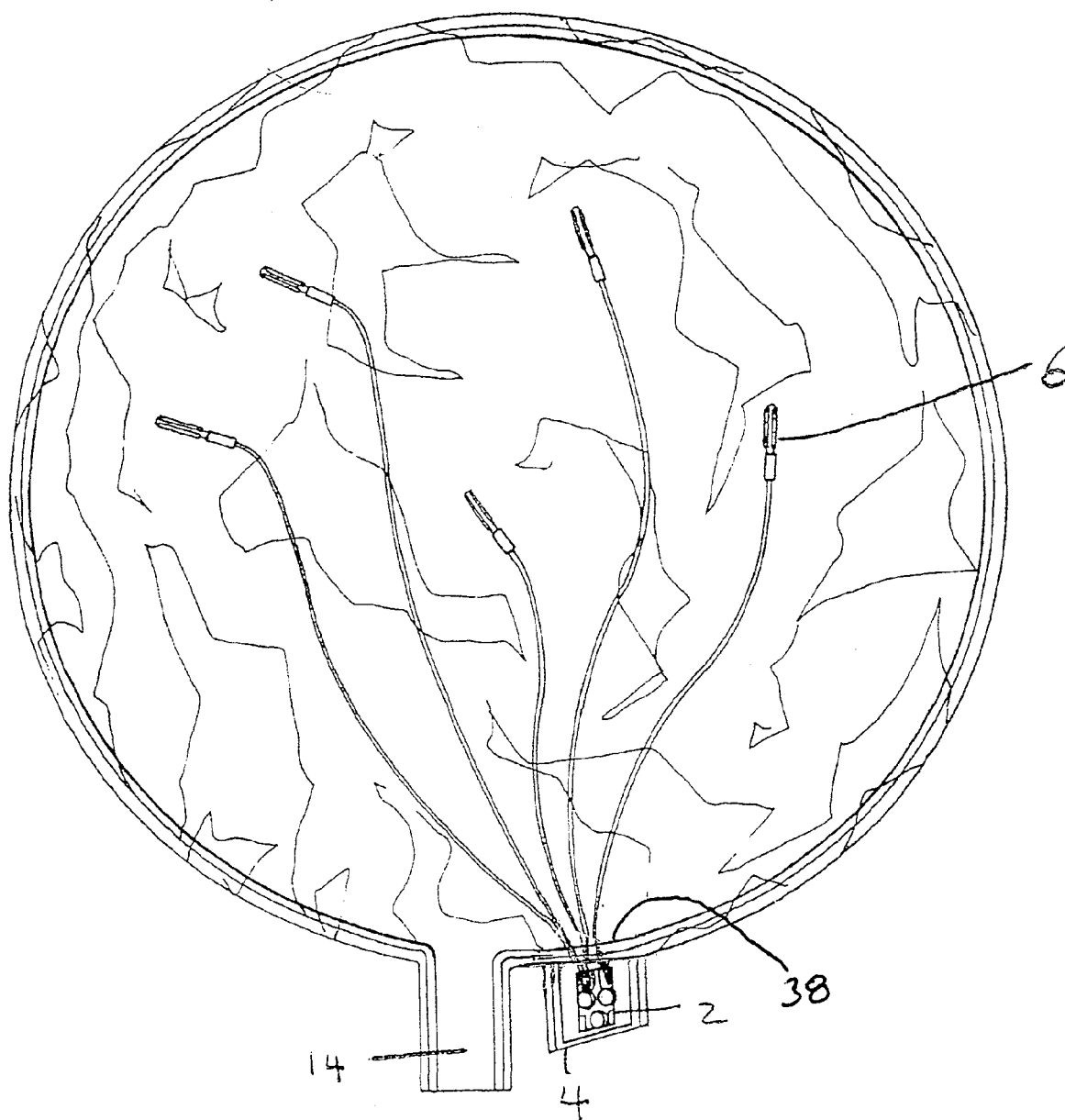


FIG. 11

LED EMBEDDED BALLOON**CLAIM OF PRIORITY**

[0001] Applicant claims priority for this patent application from U.S. provisional patent application Ser. No. 61/062,327, filed Jan. 26, 2008, of common inventorship herewith.

FIELD OF THE INVENTION

[0002] The present invention pertains to the field of balloons, and more specifically to the field of illuminated balloons.

BACKGROUND OF THE INVENTION

[0003] The prior art has put forth several ideas for illuminating balloons.

[0004] Lighted balloon technology dates back to at least 1946, with U.S. Pat. No. 2,542,361 to Roxburgh. The theme of inflating a balloon around a light bulb is found in this and several later patents, to with: U.S. Pat. Nos. 5,215,492, 5,499,941, 6,146,001, and 7,252,414. All of these aforementioned patents require an external power source.

[0005] U.S. Pat. No. 7,077,553 uses an external power source and a straw-like tube for wiring to extend from the inside to the outside of the balloon. This patent also discloses the use of shapes mounted near the light to create a shadow form.

[0006] U.S. Pat. No. 6,238,067 also uses an external power source in addition to an LED light source. It also includes a light support system for the light source within the balloon.

[0007] The use of fiber optic elements is disclosed in U.S. Pat. No. 5,857,760 with an external power source.

[0008] U.S. Pat. No. 5,444,607 discloses the use of an interior bulb, but uses a battery in the mounting device. Technically, this is still an external power supply.

[0009] U.S. Pat. No. 5,083,250 discloses a "bullet" shaped flashlight to insert into a balloon. U.S. Pat. Nos. 5,117,344 and 5,075,830 use a small bulb on the outside of the balloon, external power supply, and show shapes for light to shine through.

[0010] U.S. Pat. No. 6,602,105 shows a device for use with "mylar" or inelastic thin film balloons. It consists of a light source inserted into the balloon through a tube.

[0011] U.S. Pat. Nos. 6,106,135, and 6,371,638 to Zingale et al describe several features. Among the features included are an internal power supply, such as a DC battery, and light sources such as fiber optic or chemiluminescent device (light stick).

[0012] None of these prior art references describe the present invention. Prior art illuminated balloons having the light source at the base of the balloon typically provide dim lighting which is only visible at night or in darkened environments.

[0013] The shortcomings of prior art devices are what led to the development of the present invention, namely, to put the LEDs on the inside surface of the balloon having light shining through transparent windows in the balloon.

SUMMARY OF THE INVENTION

[0014] It is a primary object of the present invention to provide a balloon which is brilliantly illuminated by LEDs having illumination that easily visible in any ambient light environment.

[0015] It is an object of the present invention to provide a balloon which provides brilliant illumination utilizing LEDs embedded into or mounted onto the inside surface of the balloon. This is in contrast to prior art illuminated balloons having the light source at the base of the balloon which provides dim illumination visible at night and only dimly visible during the day. The balloons of the present invention provide very bright light which can be easily visible during the day as well as at night.

[0016] It is an object of the present invention to provide a balloon which provides brilliant illumination utilizing LEDs embedded into or mounted onto the inside surface of the balloon wherein the placement of the LEDs is such that the illumination shines through portions of the surface of the balloon designed to allow the transmission of light there-through.

[0017] It is an object of the present invention to provide an inelastic balloon having LEDs mounted on the inside surface thereof also having an accessible battery.

[0018] It is a further object of the present invention to provide an inelastic balloon having LEDs mounted on the inside surface thereof also having a replaceable battery.

[0019] It is a further object of the present invention to provide an elastic balloon having one or more LEDs inside the balloon which LEDs comprise an insert, which insert terminates in a faceted lens.

[0020] It is a further object of the present invention to provide an inelastic balloon having one or more LEDs attached to an insert for inserting into the balloon, further comprising a tether on the insert for the purpose of retrieving the insert for re-use.

[0021] It is a further object of the present invention to provide an inelastic balloon having one or more LEDs attached to an insert for inserting into the balloon wherein the insert comprises a moving lens.

[0022] It is a further object of the present invention to provide an inelastic balloon having one or more LEDs attached to an insert for inserting into the balloon wherein the insert comprises a two-part lens where one part rotates atop the other.

[0023] It is a further object of the present invention to provide an inelastic balloon having one or more LEDs attached to an insert for inserting into the balloon wherein the insert comprises a lens with "cut-out" portions.

[0024] It is a further object of the present invention to provide an insert for a balloon wherein the insert is waterproof.

[0025] The LED's are light weight, and low heat, and prior art devices have incorporated them by inserting them into the base or bottom of the balloon. These devices are typically only visibly illuminated during the night or in a darkened environment.

[0026] In contrast, the present invention provides balloons having the LEDs embedded into the inside surface or directly mounted to the inside surface of the balloon, thereby creating a nice decoration for a party or gift that is visibly illuminated during the day as well, and offers far superior in brightness during the night or in a darkened environment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] FIG. 1 is a front view of a balloon of the present invention.

[0028] FIG. 2 is a close up showing the LEDs mounted on the inside of the balloon.

[0029] FIG. 3 is a close-up view showing the power supply of the present invention.

[0030] FIG. 4 shows an alternative embodiment of the balloon of the present invention.

[0031] FIG. 5 shows a further alternative embodiment of the balloon of the present invention.

[0032] FIG. 6 shows a side view of an insert of the present invention.

[0033] FIG. 7 is a front view of an insert of the present invention.

[0034] FIG. 8 is a side view of an insert of the present invention showing internal structures thereof.

[0035] FIG. 9 is a back view of an insert of the present invention.

[0036] FIG. 10 is a perspective view of an insert of the present invention.

[0037] FIG. 11 is a front view of the present invention showing the tab sealed from the main body of the balloon for replaceable batteries.

DETAILED DESCRIPTION OF THE INVENTION

[0038] As used herein, the term “inelastic balloon” refers to a balloon made of any suitable inelastic material, such as Mylar™, for example.

[0039] As used herein, the term “balloon” refers to a bag for containing fluid or other gas configured in a circular or other suitable geometric configuration for use as a toy, or ornamental or display device.

[0040] The present invention comprises an inelastic balloon made of any suitable inelastic material, such as mylar, for example, having sufficient size to provide adequate buoyancy to float the balloon when filled with helium or other lighter than air balloon gas. An essentially circular balloon having a circumference of about 22 inches is operable for use in the present invention, for example.

[0041] This invention comprises a balloon, which can be of any type, but may be made of inelastic material, such as mylar, for example, which balloon further comprises a text or design portion of different light transmissivity than the background of the balloon. This portion of different light transmissivity is illuminated by LED (light emitting diode) units which are mounted inside the balloon wall. These portions of differing transmissivity act as windows, allowing the light from the LEDs to shine brightly. The LED units and their power supply are all inside the balloon. The LEDs can be mounted to the inside of the balloon by means of adhesive mounted on the inside surface of the balloon, or by means of adhesive attached to the wire connected to the LED. The LEDs can also be taped to the inside surface of the balloon using suitable tape.

[0042] The wires used to connect the lamps to the power source are comprised of minimum thickness to minimize weight, but of sufficient thickness to carry the necessary power. It is contemplated that conductive wires of about no more than 18 and no less than about 26 gauge (AWG) are useful for the present invention.

[0043] In an alternative embodiment, a foil track may be used for transmission of the electricity from the battery to the LEDs.

[0044] The invention also comprises an off/on switch at the base of the balloon. The LED's may be of varying colors. The LED's illuminate the letters or shapes from within the balloon.

[0045] The LEDs used in the present invention are light-weight, low heat producing lamps which provide adequate illumination so that the illumination can be easily seen during the day and provide brilliant illumination at night or in a darkened environment.

[0046] An additional novel feature of the present invention is the placement of the power supply in a special tab designed for this purpose. FIG. 1 shows the tab as an integral part of the gas containment cavity of the balloon. FIG. 11 shows the tab as sealed off from the gas containment cavity of the balloon so that the power supply can be accessed for replacement of the batteries without the necessity of evacuating the gas containment cavity of the balloon.

[0047] The tab is a protruberance on the periphery of the balloon which can be of any geometric configuration, but an essentially square or rectangular configuration is shown in FIGS. 1 and 11.

[0048] The tab can be sealed from the gas containment cavity by any suitable sealing means. These sealing means include, but are not limited to, self closing mechanisms, Zip-Lock™ type closures having a notch to accommodate the passage of the wire, or heat sealing, for example.

[0049] In an alternative embodiment, the balloon can be designed to accommodate the power supply 2 on tab 4 on the periphery of the circumference of the balloon near the point of inflation. See FIG. 1.

[0050] In a still further embodiment, tab 4 can be sealed from the gas containment cavity of the balloon to access the power supply to accommodate the changing of batteries without deflating the balloon.

[0051] FIG. 1 shows a front view of a balloon according to the present invention showing power supply 2, tab 4 and LEDs 6. Also shown is gas or air inlet 14 for inflation of the balloon. The balloon can be made by press fitting two halves of material together according to practices customary in the art.

[0052] FIG. 2 is a close-up of LED 6 in an illuminated state.

[0053] FIG. 3 shows a close up of tab 4 to accommodate power supply 2 of the present invention. The power supply 2 includes sequencing pattern chip 10 which sequence can be blinking, patterned or other sequence. The chip is covered by a dome switch 12 for turning the lights off and on. Power supply 2 is also equipped with coin cell batteries 8. In the present example, 3 batteries are provided. Any number of batteries can be utilized depending on the number of LEDs to be powered and the desired brightness of the LEDs. The power supply 2 can be equipped with any number of batteries, depending on the number of LEDs to be illuminated, and the brightness of the LEDs desired. These batteries are light-weight to allow flotation of the balloon. The power supply is manufactured according to typical practices known in the art.

[0054] The number and placement of LEDs can be any number and placement desired. The window can be clear, or of any color. The LEDs can be a combination of colors, or of a single color, or white, selected from all colors of the visible spectrum.

[0055] FIG. 4 shows an alternative design embodiment of the present invention. The areas of the balloon which is represented by the flame of the candles can be made of clear material. LED lights are mounted on the inside of the balloon at these areas to appear that the LEDs are lighting up the flames of the candles. This can be repeated for any desired number of candles. The LEDs are mounted to the inside of the balloon by means of adhesive mounted on the inside surface

of the balloon, or by means of adhesive attached to the wire connected to the LED. Any suitable adhesive can be utilized, such as isotactic polypropylene, for example.

[0056] FIG. 5 shows a further alternative design of the balloon of the present invention. In this case, the eyes of the jack-o-lantern are made of clear material. LEDs are mounted on the inside of the balloon at these areas to appear that the LEDs are lighting up the eyes of the jack-o-lantern.

[0057] In an alternative embodiment, the balloon of the present invention comprises an insert. The insert comprises one or more LEDs for providing illumination. The insert also comprises the power supply for the LEDs. The insert also comprises an off-on switch and also a tether for retrieval. The insert further comprises a lens for providing decorative or interesting light patterns. The lens can be a single, one part lens.

[0058] In an alternative embodiment, the lens can comprise one or more parts wherein one part moves in relation to another. It is contemplated that a two-part lens is provided wherein one part rotates atop the other part.

[0059] In an alternative embodiment, the insert is waterproof.

[0060] FIG. 6 shows a side view of an insert. This figure shows faceted lens 32. This figure also shows tether 22

[0061] FIG. 7 shows a front view of an insert comprising a faceted lens 32.

[0062] Internal structures of the insert of the invention are shown in FIG. 8. These include:

- [0063] 20, large spring to contact positive pole;
- [0064] 22, tether to balloon;
- [0065] 24, plastic on off pressure switch;
- [0066] 26, metal dome on off switch, activated by pressing 24 above;
- [0067] 28, Integrated Circuit
- [0068] 30, negative pole for soldering LED LEGS;
- [0069] 32, transparent clear housing forming faceted lens;
- [0070] 34, LED lamp; and
- [0071] 36, small spring to push batteries tight.

[0072] It is also contemplated that the insert described above can be utilized in elastic materials balloons, such as latex, for example.

[0073] Although this invention has been described with respect to specific embodiments, it is not intended to be limited thereto and various modifications which will become apparent to the person of ordinary skill in the art are intended to fall within the spirit and scope of the invention as described herein taken in conjunction with the accompanying drawings and the appended claims.

1. A balloon made of inelastic material, said balloon having an inside surface and an outside surface, said balloon further having a periphery, and wherein the balloon comprises:

- a) a gas containment cavity;
- b) a gas inlet;
- c) a tab on the periphery of the circumference of the balloon;
- d) at least one LED mounted to the inside surface of the balloon; wherein the LED further comprises:
 - 1) a lamp portion; and
 - 2) a wire portion; and
- e) a power supply; and wherein the power supply is mounted on the tab and wherein the power supply further comprises:
 - 1) an integrated circuit;
 - 2) a manually operated switch; and
 - 3) a multiplicity of coin batteries.

2. The balloon of claim 1 wherein the tab is sealed from the gas containment cavity and wherein the batteries are replaceable.

3. The balloon of claim 1 wherein the tab is an integral part of the gas containment cavity and wherein the batteries are not replaceable.

4. The balloon of claim 1 wherein the wire portion is 18 gauge or smaller.

5. The balloon of claim 1 wherein the mounting is by means of tape.

6. The balloon of claim 1 wherein the mounting is by means of adhesive attached to the wire portion of the LED.

7. The balloon of claim 1 wherein the mounting is by means of adhesive attached to the inside surface of the balloon.

8. The balloon of claim 1 wherein the integrated circuit comprises a sequencing pattern chip wherein the sequencing pattern chip is programmed for intermittent on or off of the LED.

9. The balloon of claim 1 wherein the integrated circuit allows the LED to be continuously illuminated.

10. The balloon of claim 1, wherein the inelastic material of the balloon further comprises a text or design portion of different light transmissivity than the background of the balloon.

11. The balloon of claim 10, wherein the LED is mounted on the inside surface of the balloon so that the lamp portion of the LED illuminates the portion of the balloon of different light transmissivity than the background of the balloon.

12. The balloon of claim 1, wherein the multiplicity of batteries is 3.

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