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(54) UMBRELLA LIGHT

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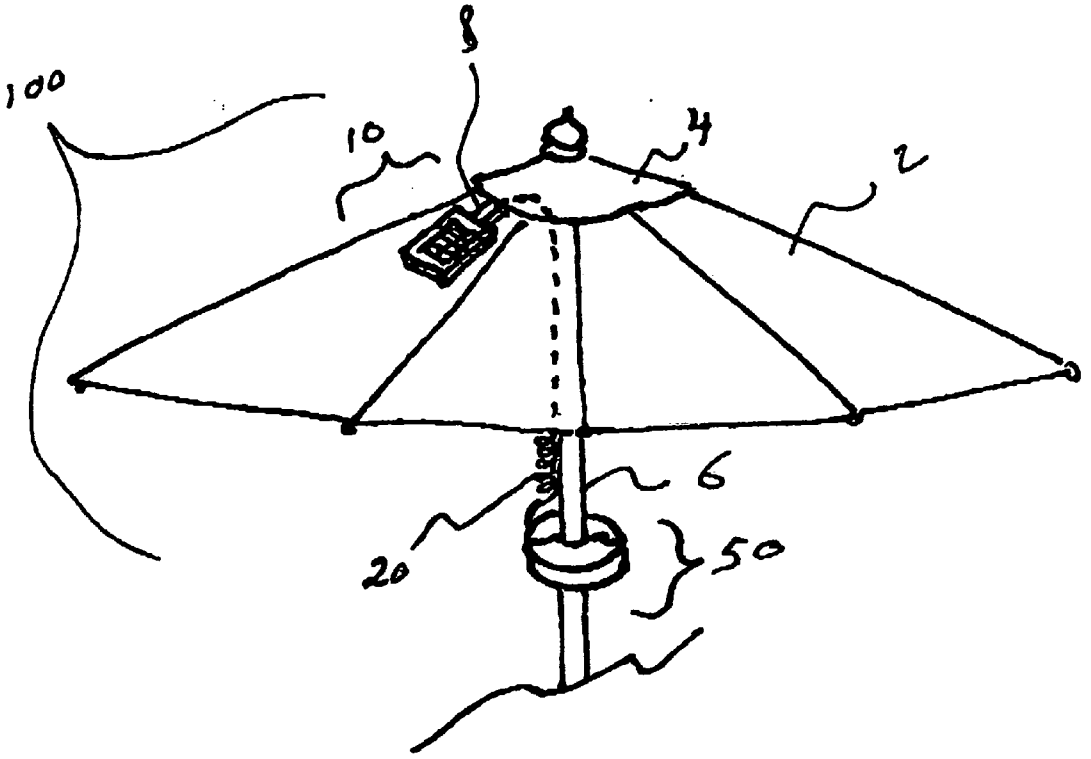
(57) **ABSTRACT**

An umbrella light that can be attached to most common outdoor umbrellas using a pair of opposing semi-circular housings permanently joined by a hinge and a single torsion spring. The spring is biased inward towards the central aperture thereby creating an effective means of attachment. Within the housings are a plurality of LED's, batteries and an optional IC charging monitor. An optional solar panel is attached to the umbrella via an attachment clip. All components are wired in a standard way. The housings each include a centrally located hemispherical cut out area creating a circular aperture to allow for attachment to the support pole of a standard outdoor umbrella, and a self contained flat clip for non-pole use. The floor of the housings has a plurality of apertures that allow light from the enclosed LED's to exit.



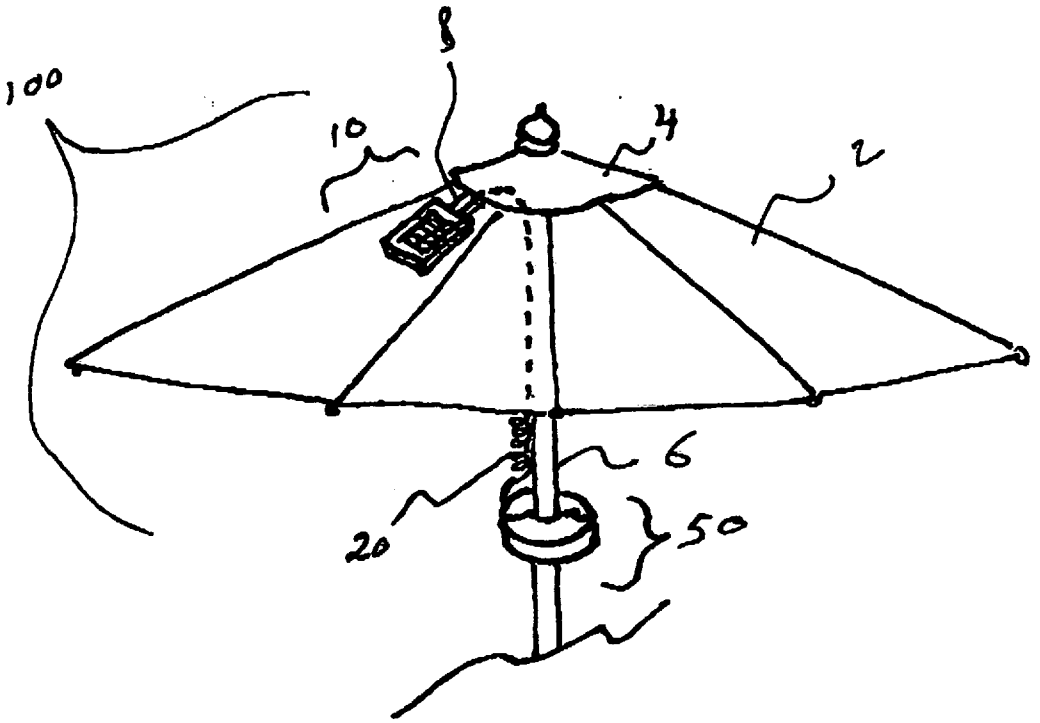


FIG. 1

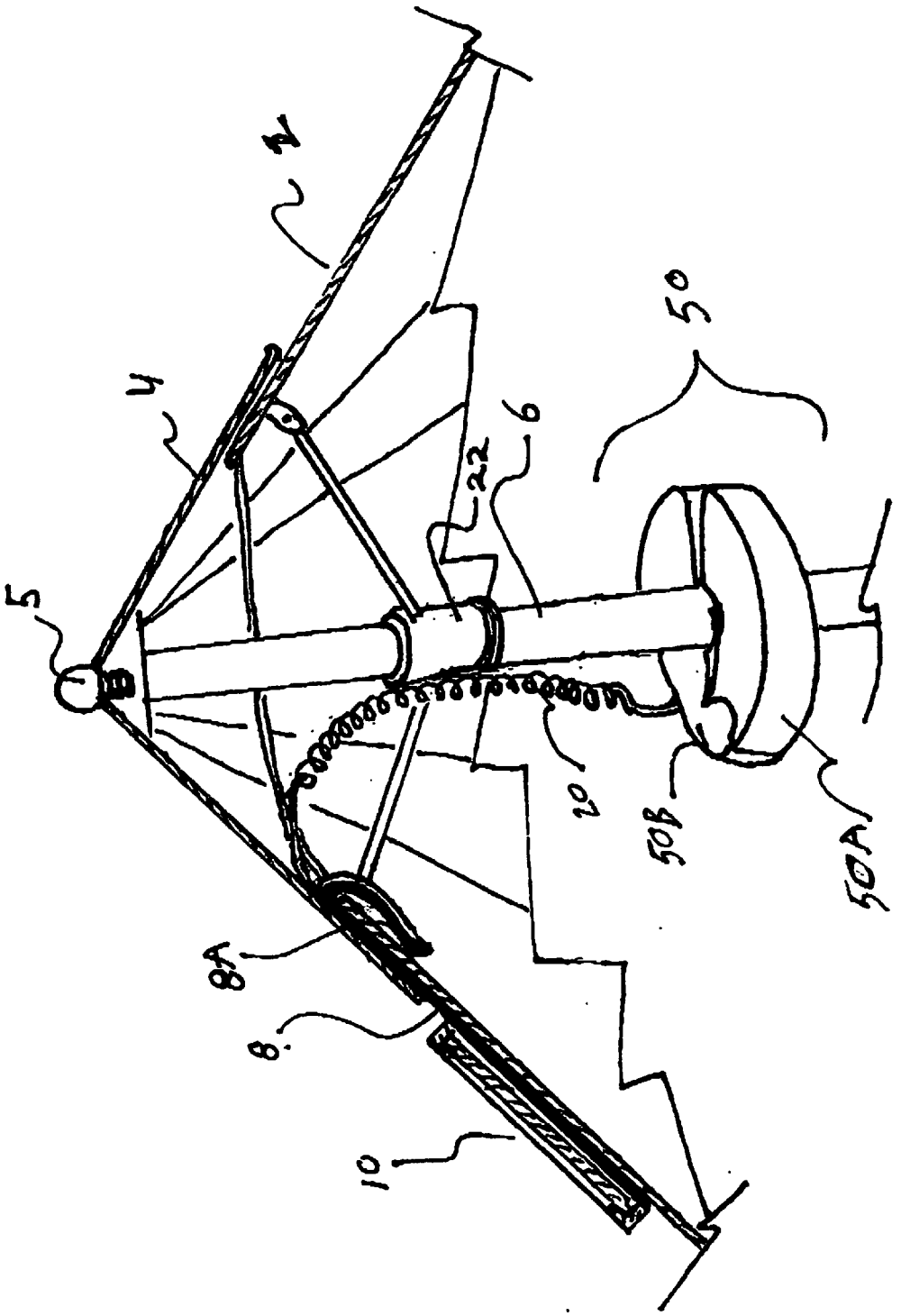


FIG. 2

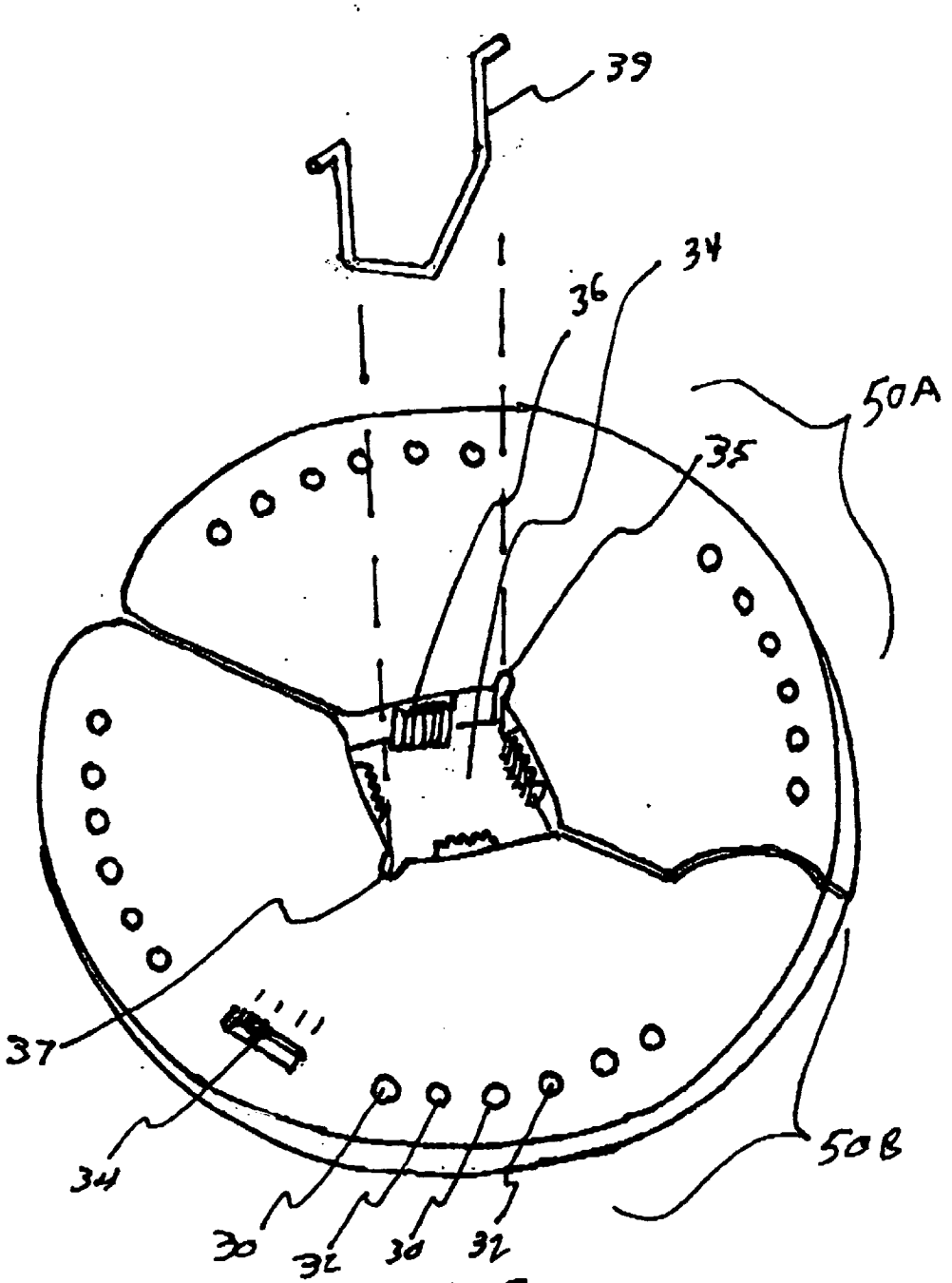


FIG. 3

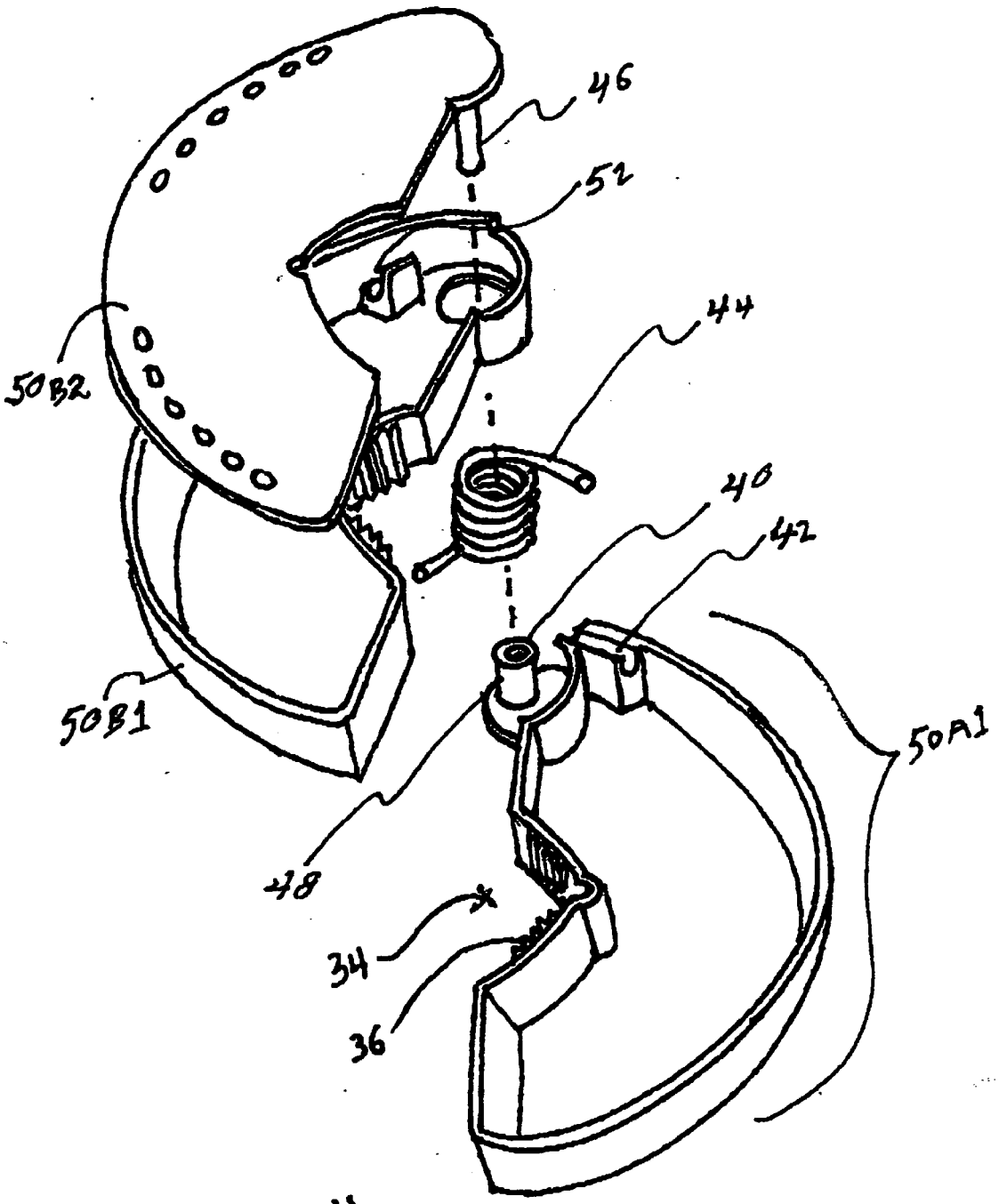


FIG. 4

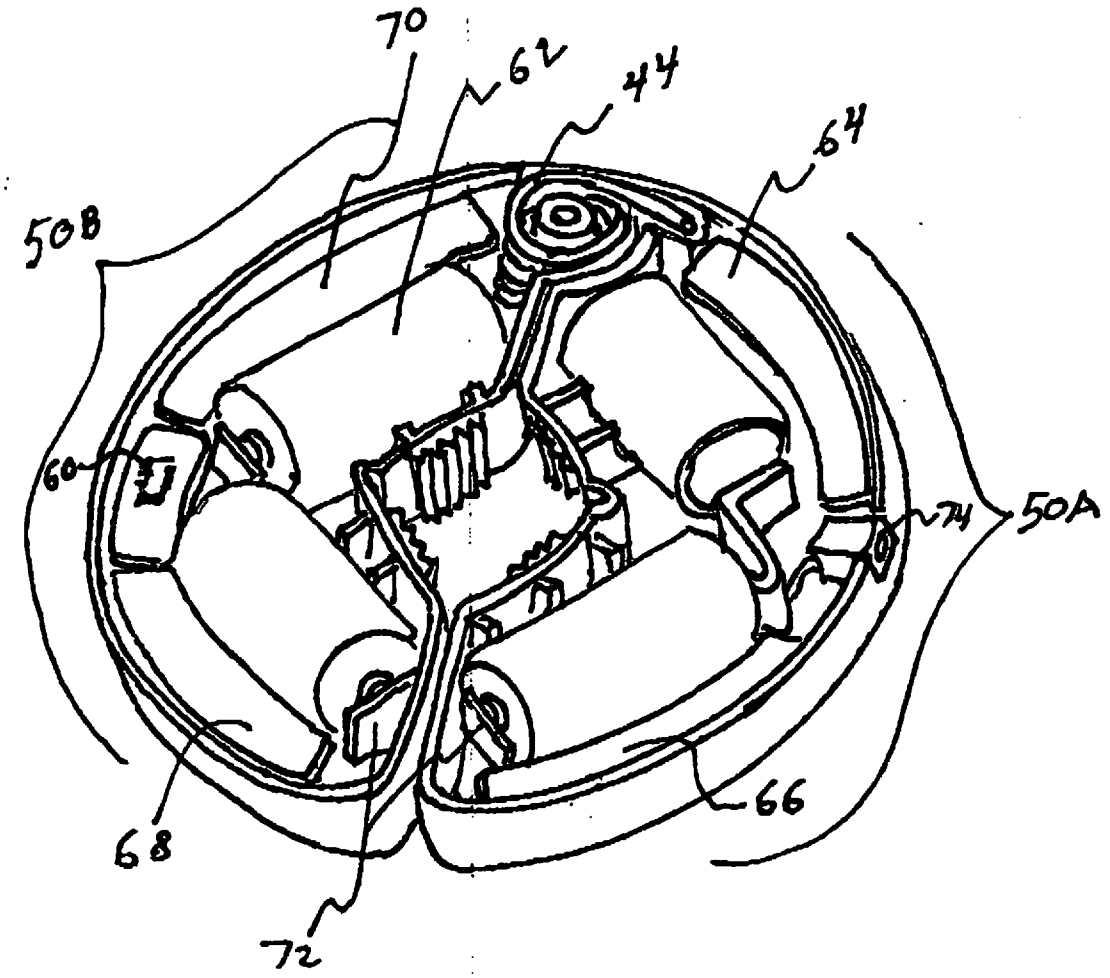


FIG. 5

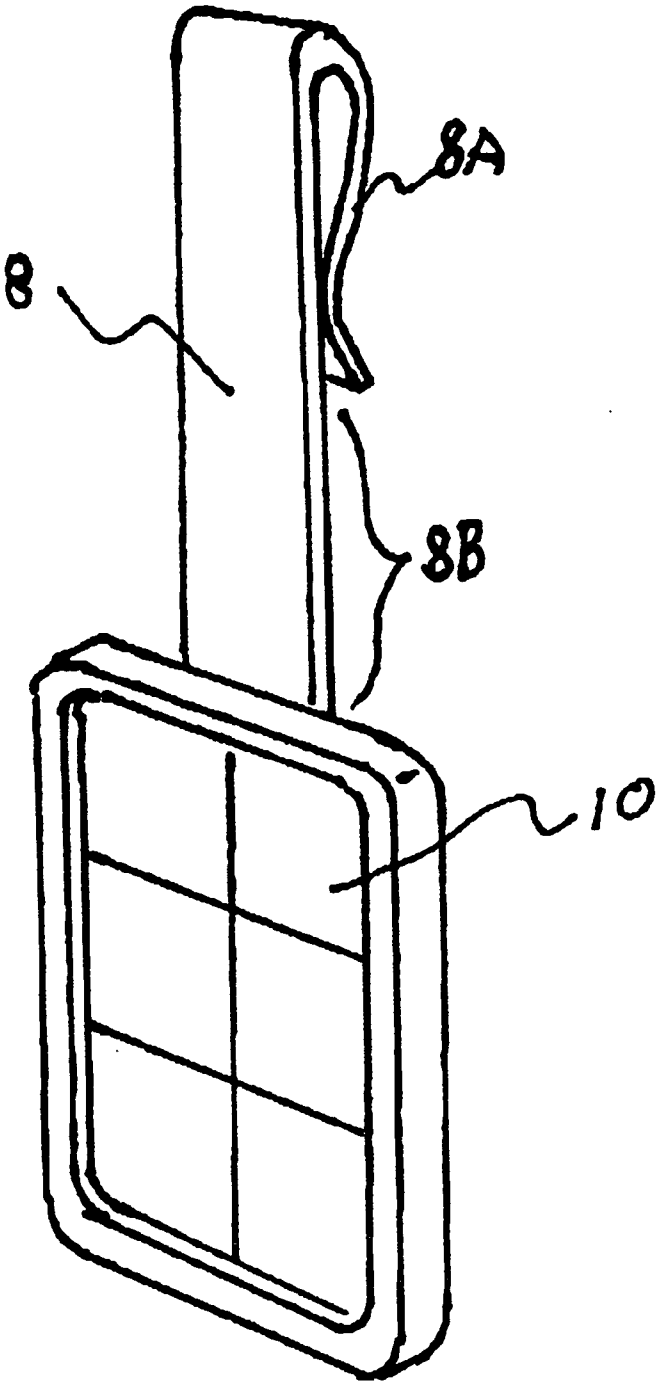


FIG. 6

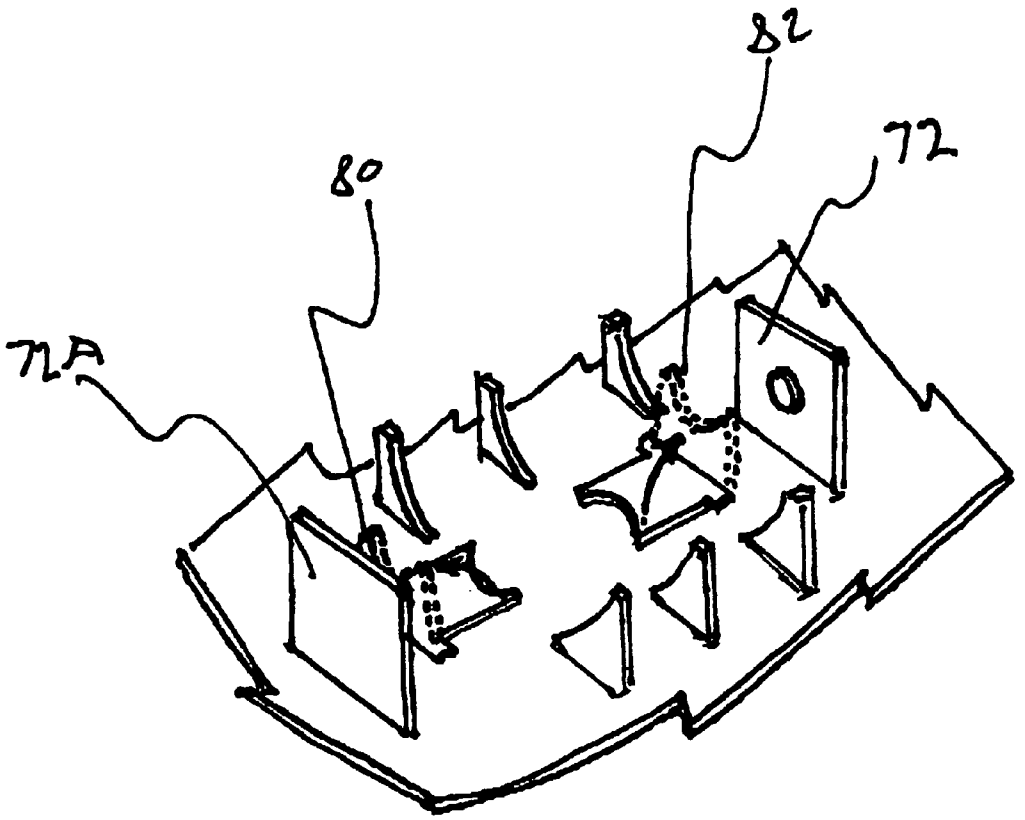


FIG. 7

UMBRELLA LIGHT

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

DESCRIPTION OF ATTACHED APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] This invention relates generally to the field of outdoor umbrella accessories and more specifically to an umbrella light.

[0005] Outdoor umbrellas have been used in residential and commercial settings for many years. Traditionally they serve the purpose of creating comfortable shade in an otherwise sunny, hot environment. However, in recent times it has also become popular to use outdoor umbrellas during evening activities such as having an outdoor dinner or other evening event. It is desirable to have a source of illumination during such evening events.

[0006] To this end, the addition of a lighting fixture to the underside of an umbrella, which could shine light down on a table and surrounding people or other objects would be desirable. Another desirable feature would be a lighting source that, by using batteries as a power source, did not require to be plugged into a standard 120 VAC outlet. And even more desirable would be a lighting fixture that used the sun as a means of recharging its battery source.

[0007] A number of inventors have anticipated this problem and suggested potential solutions. These include U.S. Pat. No. 6,612,713, U.S. Pat. No. 6,966,667 and patent applications 2005/0117326, 2004/0149325. However, each solution described in prior art includes certain deficiencies that the present invention overcomes. None of the above patents or applications describes a way to easily attach an umbrella light to an existing standard umbrella in a way which universally requires no assembly, tools or closure buckles. None include a combination of independently controlled cool white and amber LED's for optimum color balance, and none uses a choice of AA or C type batteries. Finally, none includes an umbrella attachment clip to easily attach a solar panel to the outside fabric of a standard umbrella.

BRIEF SUMMARY OF THE INVENTION

[0008] The primary object of the invention is to provide an umbrella light that derives electrical power from a DC battery source located within the light housing.

[0009] Another object of the invention is to provide a fully assembled umbrella light that can be easily attached, by means of a single torsion spring, at any desired height to the support pole of an outdoor umbrella.

[0010] Another object of the invention is to provide an umbrella light whose color output can be balanced using a combination of independently adjustable cool white and amber LED's.

[0011] A further object of the invention is to provide an umbrella light that allows easy attachment of a solar panel to the fabric portion of an umbrella and includes an electrical cable that feeds power to rechargeable batteries located within the light housing.

[0012] Another object of the invention is to provide an umbrella light that can alternately be hung on any convenient hook for non umbrella pole applications.

[0013] Yet another object of the invention is to provide an attachment means for an umbrella light that requires no tools or buckles to install.

[0014] Still yet another object of the invention is to provide an umbrella light that can accommodate C or AA type batteries.

[0015] Another object of the invention is to provide a charging system that uses an integrated circuit instead of a light sensor to manage use between the solar cell and battery operations.

[0016] Other objects and advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

[0017] In accordance with a preferred embodiment of the invention, there is disclosed an umbrella light that can be attached to most common outdoor umbrella's comprising: a permanently hinged pair of opposing semi-circular housings that together form a doughnut shape, a plurality of LED's, a plurality of batteries, an IC charging monitor, an optional solar cell panel, a solar cell to umbrella attachment clip, a torsion spring, a plurality of resilient gripping members, an on-off and light selector switch, and a plurality of metal battery contacts. Said LED's, said battery contacts, said on-off switch, said batteries and said IC charging monitor wired in a standard way within said housings to cause said batteries to charge in daylight and cause said LED's to illuminate during darkened conditions. Said battery holding area include a pair of hinged support members that allow either C type or AA type or other batteries to be used. Said attached, hinged housings each including a centrally located hemispherical cut out area thereby creating a circular aperture to allow for attachment to the various sized support poles of standard outdoor umbrellas, the floor of said housings having a plurality of apertures that allow light from said enclosed LED's to exit, said housings including said torsion spring at one side of said housings so that said housings are spring biased inward towards each other thereby creating a pole retaining means. Said optional solar cell attachment clip having a solar panel attached at one end and the opposite end having a spring biased clamping member capable of attaching to the edge of the vent area of a standard outdoor umbrella.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

[0019] FIG. **1** is a perspective view of the invention attached to a standard outdoor umbrella.

[0020] FIG. **2** is a side section view of the solar panel attachment means.

[0021] FIG. **3** is a bottom view of the LED housing.

[0022] FIG. **4** is an exploded view of the housing showing location of torsion spring.

[0023] FIG. **5** is a perspective view of the LED housing with the top removed.

[0024] FIG. **6** is a perspective view of the solar panel and attached solar panel clip.

[0025] FIG. **7** is a perspective view showing the battery conversion support members.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner. Referring now to FIG. **1** we see a perspective view of the invention **100** attached to a standard umbrella **2**. It consists of housing **50** that is doughnut or other shaped so that it can attach to a standard umbrella pole **6**. A pair of coiled insulated wires **20** travel from the housing **50** to a solar panel **10** located on the outside of the umbrella fabric and held in place by solar panel clip **8**. The coiled nature of the insulated wires allows for adjustment in height of the light housing **50** without the need for additional wire retaining ties or clips. FIG. **2** shows a partial side section view of umbrella **2** and wind vent portion **4**. Attached housing **50** is comprised of two permanently hinged opposing housings **50**A and **50**B. The housing **50** can also be attached to slide-able collar **22** so that the housing **50** can raise and lower along with the umbrella portion **2**. This means that the housing does not have to be removed when the umbrella **2** is in the lowered or stored position. Most outdoor umbrellas have wind vents **4**. The present invention takes advantage of the interruption in fabric created by the wind vent **4** to attach solar panel clip **8** in place by U shaped spring biased portion **8**A. The extended length, approximately five inches, of clip arm **8** accommodates the overlap in material formed by the wind vent **4** as it overlaps the main umbrella **2** and allows solar panel **10** to be in full view of the sky without being covered by the wind vent flap **4**. Other methods of holding solar panel **10** onto umbrella **2** include a standard pin and clasp method where a pin located on the back of solar panel **10** would penetrate the fabric of umbrella **2** and be held by a clasp. Another method includes having an aperture in the frame of solar panel **10** that can be placed between the top of the umbrella **2** and the top finial **5**, which can be unscrewed and re-screwed for this purpose. For attaching the solar panel **10** to an umbrella that does not have a wind vent flap, a pocket type attachment made of cloth or plastic can be provided to the user for attachment by glue, magnetic clasp or sewing to the exterior of the umbrella surface. The pocket can then accept the clip end **8**A of solar panel clip holder **8**. FIG. **3** shows a bottom view of the housings **50**A and **50**B. LED lights **30**, **32** emit light from corresponding apertures in housing **50**A, **50**B. The LED lights are alternating in color. Half are cool white **30** and half are amber **32**. On/off selector switch **34** allows the user to select whether both amber **32** and cool white **30** are on together, or one or the other light up separately. By mixing both amber **32** and cool white **30**, a balanced warm light is generated which makes skin tones and food look more appealing. Additionally, if the user chooses to use only cool white **30** or only amber **32**, the batteries will last twice as long as when using both together. The combination of hinged torsion spring **44** and resilient bumpers **36** allow poles **6** of widely differing diameters to be held snuggly within aperture **34**. FIG. **3** also shows wire hanger **39** which can be inserted into slots **35**, **37** and can act as a hanger means for non umbrella applications such as when hanging on a hook within a camping tent. FIG. **4** shows an exploded view of housings **50**A and **50**B. Torsion spring **44** is placed over tubular post **48**. The top end of spring **44** rests in cradle **42**. The bottom end of spring **44** rests in cradle **52**. Post **46** of the bottom plate **50**B**2** can penetrate aperture **40** to form a shaft for allowing housings **50**A and **50**B to be hingedly joined. The torsion spring **44** is biased inward so that housings **50**A and **50**B tend to be forced in towards each other thereby allowing umbrella pole **6** to be securely held. To attach housing **50**A,B the user simply pulls the housings apart until the umbrella pole **6** can fit in the center portion **34**, and then releases the housings **50**A,B allowing them to spring inward and grasp the pole **6** by resilient pads **36**. FIG. **5** shows a perspective view of the housing **50**A,B with components in place. C type batteries **62** provide much longer illumination periods in comparison to AA type batteries. The present invention can operate on C batteries without any solar charging accessories, or can operate on rechargeable C batteries and an associated solar charging system as shown in the present drawings. Additionally, as shown in FIG. **7**, hinged AA battery support members **80**, **82** can be deployed within C type battery holder **72**, **72**A so that the unit may run on either C type batteries or AA type batteries. IC circuit **60** measures input voltage from solar panel **20** to the battery. When the input voltage reaches approximately zero at dusk, it instructs the batteries to connect to LED lights **30**, **32** to turn on. This is a more precise and efficient way to maximize solar recharging and to sense when to turn on the lights as compared to the more common photo sensor method. PC boards **64**, **66**, **68**, **70** all support LED's **30**, **32** in the standard way. Metal battery contacts **72**, bring power from standard recharging circuit, not shown, to rechargeable C or AA batteries **62**. Adaptor socket **74** allows a person to plug in either solar power cable **20** or to plug in an adapter cable that can provide power to the rechargeable batteries **62** or directly to LED's **30**, **32** via an AC to DC wall converter. FIG. **6** is a perspective view of the solar panel **10** and attached solar panel attachment clip **8**, **8**A. Extension arm **8**B is approximately five inches long and allows the solar panel to rest on the surface of umbrella **2** so that vent flap **4** will not cover the panel **10** thereby increasing the ability of the panel **10** to absorb the day light.

[0027] While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives,

modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An umbrella light that can be attached to most common outdoor umbrellas comprising:

a pair of permanently hinged opposing semi-circular, weather resistant housings that together form a doughnut, "C" or other shape;

a plurality of LED's;

a plurality of DC batteries;

a torsion spring;

a plurality of resilient gripping members;

an on-off and light selector switch;

a plurality of metal battery contacts; and

said LED's, said battery contacts, said on-off switch, and said batteries wired in a standard way within said housings to cause said LED's to illuminate;

said housings being permanently hinged and each including a centrally located hemispherical cut out area thereby creating a circular aperture to allow for attachment to the support pole or sliding collar of a standard outdoor umbrella;

the floor of said housings having a plurality of apertures that allow light to exit from said enclosed LED's;

said housings including said torsion spring at one side of said housings so that said housings are spring biased inward towards each other thereby creating a pole retaining means.

2. An umbrella light that can be attached to most common outdoor umbrellas as claimed in claim 1 wherein the single spring biased nature of said pole aperture allows for said housing to snuggly fit onto a variety of pole diameters or sliding pole collars

3. An umbrella light as claimed in claim 1 wherein said LED's include independently operating cool white and amber color output so that when used together, a more balanced warm light is emitted and wherein said selector switch can be positioned so that said cool white LED's or said amber LED's can be activated separately for more energy efficiency use.

4. An umbrella light as claimed in claim 1 wherein said C type battery holders can be converted to AA type battery holders by means of hinged AA battery adaptor members located within the floor of said standard C battery retaining walls.

5. An umbrella light as claimed in claim 1 further including a hanger bracket that can be removably attached to said light housing thereby allowing said housing to be supported by a standard hook rather than an umbrella pole.

6. An umbrella light as claimed in claim 1 wherein said batteries can be a recharging type and are charged by a charging system including a solar panel attached by an attachment clip that can be removably attached to the edge of a standard outdoor umbrella; said charging system including an IC charging monitor which allows for more accurate and efficient measurement of power coming from said solar panel.

7. An umbrella light as claimed in claim 1 wherein said umbrella solar panel attachment clip includes an approximately five inch extension arm to enable said solar panel to not interfere with the standard overlap vent flap found on many standard outdoor umbrellas.

8. An umbrella light as claimed in claim 1 wherein said solar panel can be attached to the fabric portion of an umbrella by alternate means such as a standard pin through fabric and associated clasp, magnetic clasps, or attachment to the top of said umbrella and retained by means of its standard finial.

9. An umbrella light as claimed in claim 1 further comprising an optional solar power clip retaining pocket that can be glued or sewn or otherwise attached to an umbrella that does not have a vent flap configuration.

10. An umbrella light that can be attached to most common outdoor umbrellas as claimed in claim 1 wherein said housing can be affixed to an umbrella pole without the need for additional tools or buckles and without the need for detaching said housing members from each other.

11. An umbrella light as claimed in claim 1 further comprising a plurality of high friction resilient strips mounted to the inside surface of said circular pole aperture so that said housing will not slip down said umbrella pole.

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