LIGHTING SYSTEMS FOR ATTACHMENT TO WEARING APPAREL

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ABSTRACT
A lighting system for wearing apparel and the like includes a sealed housing of flexible light transmitting material with at least two hollow regions interconnected by a section having an opening therein communicating between the hollow regions, a battery in one of the hollow regions, at least one light source in each hollow region for light emission through the surface of the housing, a motion responsive switch or a user-activated switch or both contained within one of the hollow regions, light controls contained within one of the hollow regions connected to the battery, the switch and the light sources for controlling the activation of the light sources responsive to operation of the switch, the weight and volume of the battery, light control means and switch being distributed among the hollow regions.
LIGHTING SYSTEMS FOR ATTACHMENT TO WEARING APPAREL

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a Continuation-in-Part of applications Ser. No. 10/766,709 filed Jan. 27, 2004, and Ser. No. 11/432,466 filed May 10, 2006 by the applicant herein and priority is claimed from the earliest filing dates of these patent applications.

BACKGROUND OF THE INVENTION

[0002] This invention relates to lighting structures for attachment to garments such as shoes, jackets and other clothing. Such garments have enjoyed significant commercial success, particularly in footwear. Lighted footwear is shown in the following U.S. Patents:


[0004] U.S. Pat. No. 5,732,486;


[0006] U.S. Pat. No. 5,882,110;

[0007] U.S. Pat. No. 6,017,128 FOOTWEAR WITH FLASHING LIGHTS, Jan. 25, 2000;


[0009] Lighted shoes may utilize one or more LEDs which may be turned on by a motion sensitive switch. One such switch utilized a coil spring having one end secured to, for example, one track of an integrated circuit, and having its other end suspended over a separate conductor track. Motion of the shoe caused the spring to bounce up and down, making multiple contacts with the separate conductor track. Each such contact caused one or more LEDs to be momentarily illuminated. Such spring-type switches are shown in U.S. Pat. No. 6,238,056 SPRING MOUNTED LIGHT, May 29, 2001; U.S. Pat. No. 5,550,721 MOTION SENSITIVE LIGHT AND BATTERY ASSEMBLY SWITCHED ON AND OFF BY THE OSCILLATION OF A HELICAL SPRING, Aug. 27, 1996; and U.S. Pat. No. 7,044,618 MOTION SENSITIVE LIGHT AND BATTERY ASSEMBLY SWITCHED ON AND OFF BY THE OSCILLATION OF A HELICAL SPRING, May 16, 2006; and U.S. Pat. No. 5,559,721.

[0010] The electrical circuit for controlling one or more LEDs connected to a battery requires, for enhanced visual effects, one or more batteries, a control circuit, usually on a circuit board, a switch, and one or more LEDs. When the battery, switch and circuit board assembly are connected together as a unit, the unit becomes somewhat bulky, e.g., one inch by three-eighths inch by one inch. This is an important factor, particularly when the light system is attached to clothing such as jackets or trousers where the battery is expected to have a useful life which may be equivalent to the life of the clothing itself. Other embodiments include timing and lighting control circuits to provide certain patterns of light flashes, which may add to the volume of the system.

[0011] There is a definite need and desire for lighting and other electronic systems for attachment to wearing apparel that provides greater flexibility than with currently available lighting and other electronic systems. There is also a need for self-powered lighting and other electronic systems sewn or otherwise attached to a garment such as a jacket with light emission or another electronic function from one or more places on the garment. Marks or slits in the outer surface of the systems such as strips extending between elements of the system may interrupt light passing through the system, causing the marks or slits to emit light. Such strips are shown in U.S. Pat. Nos. 5,882,110 and 5,649,755, the disclosures of which are incorporated by reference.

[0012] Another need in the clothing and electronics fields is for lighting and other electronic systems free from known contaminants such as mercury, lead or solder of any type which might leach out over the years and enter the water supply. Applicant's co-pending application Ser. No. 11/432,466 disclosed several embodiments of solder-free and/or lead free electrical connections which may be used with mercury-free batteries to provide environmentally acceptable lighting fixtures for shoes and clothing. This '466 application also teaches a switch structure usable with the present invention which and which can be made in a smaller package than the spring switches of applicant's patents referred to above.

[0013] There is a definite need and desire for lighting and other electronic systems which provide greater flexibility for use on shoes and other clothing than existing systems provide.

BRIEF DESCRIPTION OF THE INVENTION

[0014] This invention provides sealed, preferably flexible, lighting and other electronic systems for attachment to shoes and other articles of clothing that may include two or more hollow housing portions of transparent or translucent material with one or more electronic components inside these housings. The systems preferably include a bottom member (or potting/sealant) which may be attached to, and worn for the normal useful life, e.g., several years, of a garment. Such systems may be removable and replaceable, if desired. Each system may include two or more hollow, housing portions joined by a connection device, e.g., wiring, or wiring inside a molded, sealed, hollow housing. Such hollow housing portions may be ornamental in shape; for example, these portions may take the shape of a flower including a stamen and petal portions. One or more of the hollow housing portions may be large enough inside to hold at least one LED or other lighting device for illuminating the ornamental portion(s), or at least one of the other components used to provide power for one or more LEDs, e.g., one or more batteries, a switch, and control circuitry, to activate lighting of the LEDs, or other electronic components such as transducers, displays, and electromechanical devices. The switch may be motion-activated, manually activated, or both motion-activated and manually-activated. If a lighting or other system requires a plurality of one or more of these components, the components may be distributed over all or part of the housing portions of the system to minimize weight and/or volume imbalances that might otherwise arise. This distribution of components allows the system to be smaller, and more comfortable to a wearer.

[0015] The connection devices between the hollow portions may include channels for holding wiring for the electrical elements of the system and may also provide a surface for enhanced lighting effects. The connector devices may also hold the housing portions together, simplifying assembly/manufacturing.
0016] The electrical operating elements of the system may include, in addition to lighting elements such as light emitting diodes, a battery, e.g., a coin-shaped battery, a control circuit on an electronic circuit board or in the form of an integrated circuit, and an electromechanical motion responsive switch or accelerometer.

0017] In some embodiments, each housing may be sealed and preferably includes a flange around most of its periphery for sewing or otherwise attaching the housing to a garment. Alternatively, the housing may be attached to garments by hook and loop fasteners for removal for cleaning or washing of the garment.

0018] Preferably, the LEDs are illuminated when the article of clothing to which the system is attached is worn. If a system ceases operating before the garment has reached the end of its useful life, the system may be removed, and another system may be attached in its place.

0019] Preferably, each system attaches at least two separate spaced portions on a garment to minimize the bulk of the system, and to exhibit attractive, flashing light from several areas of the garment. The system's connection devices, which are preferably exposed to LED illumination, may also emit light from slits or marks on their outer or inner surfaces, or both, where, e.g., the connection devices are hollow, molded channels. These lighting systems, when attached to garments, make the garments more comfortable and more attractive, and provide moving illumination for a wearer, day or night. Some embodiments of the system may comprise one or more lighted toys.

BRIEF DESCRIPTION OF THE DRAWINGS

0020] This invention may be better understood from the following Detailed Description of the Drawings with reference to the drawings, in which:

0021] FIG. 1 is a front elevational view of an individual wearing a jacket having decorative lighting systems attached to the sleeves of the jacket;

0022] FIG. 2 is a perspective view of the decorative lighting system of FIG. 1 for attachment to a garment;

0023] FIG. 2A is an exploded sectional drawing of the connection device that forms part of the system shown in FIG. 2;

0024] FIG. 3 is a side elevational view of the system of FIG. 2 showing a bottom member of the system separated from the housing of the system;

0025] FIG. 4 is a top view showing the system in phantom and distribution of electrical parts in the system of FIGS. 1-3;

0026] FIGS. 5A, 5B and 5C are sectional views taken along lines 5A-5A, 5D-5D and 5C-5C of FIG. 4, respectively;

0027] FIG. 6 is a schematic view of an embodiment of an electrical system for use in the lighting system of FIGS. 1-5;

0028] FIG. 7 is a perspective view of a second embodiment of the lighting systems of this invention;

0029] FIG. 8 is a longitudinal sectional view of the system of FIG. 7;

0030] FIG. 9 is a top plan view of the system of FIG. 7 with the upper housing or cover in phantom showing the distribution of electrical parts within the system of FIG. 7;

0031] FIG. 10 is a schematic of the electrical circuitry of FIGS. 7-9, showing the placement/positioning of the electrical components of the circuitry;

0032] FIG. 11 is a perspective view of the first embodiment of the invention showing a plurality of magnets for attaching the housing of the lighting system to the bottom member;

0033] FIG. 12 is a transverse sectional view of the housing in the first and second embodiments, showing a manually operated switch for activating the LEDs instead of a motion-activated switch;

0034] FIG. 12A is a transverse sectional view of the housing in the first and second embodiments showing a coiled, flexible, stress/strain-reduced connection assembly of the interconnecting conductors of the circuitry;

0035] FIG. 13 shows flex circuitry such as Kapton flexible ribbon circuits in the electrical systems of FIGS. 1-10 that allow for flexing with slack loops to allow repeated bending and stretching and to minimize failure from broken circuits;

0036] FIG. 14 is a perspective view of a decorative lighting system similar to the system shown in FIG. 1, here including heart-shaped housing portions, for attachment to a garment;

0037] FIG. 15 is a perspective view of a decorative lighting system similar to the system shown in FIG. 1, here including a branched, non-linear array of flower-shaped housings, for attachment to a garment;

0038] FIG. 16 is a front elevational view of a shirt, belt, and pants having decorative lighting systems of differing shapes attached to the sleeves and front of the shirt, and to the pocket, belt and legs of the pants, according to the invention;

0039] FIG. 17 is a side elevational, cross-sectional view of a lighting system that includes two housing portions joined to one another solely by electrical wiring or other conductors;

0040] FIG. 18 is a perspective view of a decorative lighting system similar to the system shown in FIG. 1, here including a non-linear array of flower-shaped housings, for attachment to a garment, and showing LEDs placed to illuminate the connection devices through marks, slits and striations of the connection devices; and

0041] FIGS. 19-22 are perspective views of decorative lighting systems similar to the system shown in FIG. 1, here including toy airplane-shaped, toy pick-up-shaped, star-shaped, and athletic bull-shaped housing portions, respectively, for attachment to a garment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

0042] Referring now to FIGS. 1-3, FIG. 1 shows an individual I wearing a jacket J having sleeves S. Attached to the sleeves are decorative light systems 10, which may be stitched or otherwise attached to sleeves S. Systems 10 include housings or bodies, which may be made of a flexible molded transparent or translucent plastic such as polyvinyl chloride (PVC) or a polymeric rubber. Systems 10 include edge flanges 10F (see FIG. 2) for receiving adhesive or stitching for attaching systems 10 to sleeves S. Lighting systems 10 include decorative end portions 12 and 16, and decorative middle portion 14. Adjacent portions 12/14 and
14/16 are connected to one another by molded, hollow connection devices 26/28 to form a unitary, sealed, self-contained electrically illuminated system that may be one molded unit, with electrical components distributed throughout the housings of the system for attachment to a garment such as jacket J.

[0043] Alternatively, as shown in FIG. 17, adjacent housing portions 14A and 16A can be joined to one another by electrical wiring 28A alone, without a molded, hollow connection devices around the wiring.

[0044] Portions 12, 14 and 16 are formed into flowers that extend above the level of connection devices 26 and 28 much like a flower extends above its stem. Portions 12, 14, and 16 may each enclose one or more light emitting diodes, hereinafter designated LEDs. LEDs 20, 22 and 24 are placed inside portions 12, 14, and 16, as indicated by the dashed lead lines in FIG. 2, and are positioned to emit light outward from the center or stamen portion, and from the petals of the flowers, or into the connection devices 26, 28 or both, as FIG. 5A shows; see also FIGS. 3-6. Alternatively, one or more of the LEDs could extend through openings to the outside of system 10. The system is visible from the front, rear and particularly from the side of the jacket J, and may flash in response to movement of a wearer's arms, e.g., while walking or running. The flashing lights may also provide a degree of safety to persons wearing such garments, especially at night, and with electrical components distributed throughout the housings to reduce the size of the hollow regions inside the housings of the system, and to increase the wearer's comfort.

[0045] FIG. 2 provides a perspective view of lighting system 10, in the form of a single molded part, shown apart from, and ready for attachment to a garment. System 10 includes three flower-shaped portions 12, 14 and 16, each of which includes a centrally located stamen portion 18 inside which an LED or lamp 20, 22 or 24, and preferably at least one LED is positioned. The LEDs 20, 22 and 24 are shown in better detail in FIGS. 5A, 5B and 5C, and appear in FIG. 2 as dashed lines because they are located inside portions 12, 14 and 16. FIG. 2A is a sectional view taken along line 2A-2A of FIG. 2.

[0046] Extending between flower shaped housing portions 12 and 14 and between flower shaped housings 14 and 16 are molded connection devices 26 and 28, respectively, including internal channels 26C and 28C, shown as dashed lines in FIG. 2. Leads connecting the electrical elements of system 10 pass between portions 12, 14 and 16 through channels 26C and 28C (see FIG. 2). Connection devices 26 and 28 may be formed in the shape of flower stems to enhance the decorative effect of system 10.

[0047] FIGS. 3, 4, 5A, 5B, 5C and 6 and show additional views of system 10. In FIG. 3, bottom closure member 30 is separated from system 10 as indicated by the arrows directed toward the assembled location of member 30 instead of bottom 30, a flexible potting/filler material may be used. Such materials act as a heat sink when a garment bearing the system is washed and dried. Such as a common cloth dryer which can heat up to 180°F. Member 30 acts as a closure for system 10, and is preferably flexible and made of the same material as system 10's other portions, but need not be transparent or translucent. Member 30 may also be made of flexible magnetic material, or include magnets, as shown in FIG. 11, as is used in refrigerator magnets, so that lighting system 10 may be held by magnetic attraction to any ferromagnetic material which may be sewn or otherwise attached to a garment, e.g., sleeves S. As an alternative, magnets may be secured to sleeves S, and ferromagnetic material may be contained within system 10 on its underside.

[0048] Member 30 is attached to the bottom surface of the housing for lighting system 10 along the under side of portions 12, 14 and 16 and connection devices 26 and 28 that include internal channels 26C and 28C so that system 10 is sealed from the ingress of moisture or other unwanted substances. Sealing may be accomplished by bonding with an adhesive, by sonic welding, by magnets (see FIG. 11), or another known method of joining plastic parts, or by using a filler/potting material/sealer instead.

[0049] The electrical circuitry components of fixture 10 (see FIG. 4) are distributed among housing portions 12, 14 and 16 to reduce size and increase wearer comfort. These housings contain the various electrical components to power and control the illumination of the LEDs 20, 22 and 24, namely, battery 32 for powering the system, switch 44 responsive to motion for activation of the LEDs, and a control circuit on circuit board 38 for operating the circuit, thus illuminating LEDs 20, 22 and 24. Suitable control circuits of the type disclosed in the above referenced patents may be located on a circuit board, e.g., circuit board 38.

[0050] As FIG. 12 shows, the circuitry in flower-shaped housing portion 12 may include manually- operable switch 44A instead of motion-activated switch 44.

[0051] FIGS. 5A, 5B and 5C are sectional views, on an enlarged scale, taken along lines 5A-5A, 5B-5B and 5C-5C of FIG. 4. To distribute their weight and volume, the electrical components, e.g., LEDs, batteries, and control circuits, may be separated and distributed among portions 12, 14 and 16. As shown in FIGS. 4, 5A and 6, a coin-type battery 32, e.g., a 2030 lithium battery, is positioned in portion 12 along with LED 24. Such batteries may have upper and lower faces of opposite polarity. In such cases, electrical leads 36 providing power to the circuit are connected to the opposite polarity faces of battery 32 by solder-free mechanical means as disclosed in the co-pending U.S. patent application Ser. No. 11/432,466. Insulated leads 36 extend through channel 28C, as indicated by dashed lines in FIGS. 2 and 5, to portion 14 (see FIG. 5B), where LED 22 and control circuitry on a circuit board 38 or in the form of a PC board or an integrated circuit may be located (see FIG. 5B, which is a sectional view taken along line 5B-5B of FIG. 4).

[0052] FIG. 5B shows the interior of portion 14 including LED 22 atop the printed circuit board 38, which may include conductive tracks, and either an integrated circuit or discrete components, making up a timing or light control circuit, as desired. Joined to circuit board 38 are power leads 36 from battery 32 and power distribution leads 46, 48 and 48 to the LEDs 20, 22 and 24, respectively. Extending from circuit board 38 are leads 40 extending through channel 26C to motion responsive switch 44, located inside portion 16.

[0053] FIG. 5C, a sectional view of portion 16 taken along line 5C-5C of FIG. 4, shows leads 40 and 42 connected to switch 44, and lead 46 connected to LED 20. All these leads extend through channel 26C from circuit board 38.

[0054] FIG. 6 is a side elevational view of the circuitry outside system 10, and is also shown in FIG. 4 by dashed lines surrounding the circuitry, illustrating the separation of the circuitry components, reducing volume and weight, and providing comfortable, small size, distributed attractive illu-
mination. FIGS. 4 and 6 show LED 20 inside portion 12, with switch 44, and powered over leads 46; switch 44 closures are signaled to the control circuit on board 38 over leads 40, 42.

[0055] Illumination from LED 20 is visible from the top of portion 12, and may also be directed through channel 26C. See FIG. 5A, and LED 24 in phantom lines. A plurality of discontinuities in the top of connection devices 26 and 28, e.g., generally transverse slits 60S (see FIGS. 2 and 3), interrupt the passage of light through the connection devices 26 and 28. Light passing into connection devices 26C and 28C from adjacent LEDs causes slits 60S to disperse and emit flashing light when LEDs 20, 22, and 24 flash. This structure is shown in U.S. Pat. No. 5,882,110 which is incorporated by reference herein.

[0056] FIG. 6A is a schematic diagram of the electrical circuit of system 10 as shown in FIGS. 1-5. As described above, switch 44 is connected through leads 40, 42 to circuit board 38. Battery 32 is connected through leads 36 to circuit board 38. Output leads 34, 46 and 48 from circuit board 38 connect to, and provide power to LEDs 20, 22, and 24.

[0057] In operation, when switch 44 is activated, either manually or in response to movement of the system, the control circuit contained on circuit board 38 activates LEDs 20, 22 and 24 in a desired sequence and duration. LEDs 20, 22 and 24 need not be lighted, avoiding battery usage, when the system is at rest. Switch 44 may be located in portion 12 or 16, near the elbow and forearm of jacket J in FIG. 1, to take advantage of the high incidence of movement at those locations.

[0058] Leads 36 are connected to circuit board 38. Switch 44 is connected to circuit board 38 such that, when switch 44 senses motion or user activation, it sends a signal to the control or timing circuit on circuit board 38, and current flows through leads 34, 46 and 48 to cause LEDs 20, 22 and 24 to be illuminated in the pattern and duration provided by the timing and control circuit.

[0059] FIGS. 7-10 illustrate an alternate embodiment of lighting system 50. FIG. 7 is a perspective view including two lighted ornamental portions or elements in the form of flower housings 52 and 54, enclosing LEDs 56 and 58, respectively, each represented by dashed lines 56 and 58 in FIG. 7. Extending between flower housings 52 and 54 is molded connection device 60 with channel 60C inside. Light fixture 50 includes flange 60F for attachment to a garment. Connection device 60 has slits 60S on its upper surface for emitting light that passes into connection device 60.

[0060] FIG. 8 is a longitudinal cross-sectional view of system 50, showing the regions 52C and 54C inside of flower portions 52 and 54 and connection device 60C. Flower-shaped portion 52 contains a control circuit on board 62 with switch 44 attached, as shown in FIG. 9. Flower-shaped portion 54 contains a battery 66, which may be identical to battery 32. Connection device 60C carries two pairs of wires, one pair connecting circuit board 62 and its control circuit to battery 66, and another pair connecting LEDs 56 and 58 to circuit board 62.

[0061] FIGS. 9 and 10 are schematic diagrams, which illustrate the electrical circuitry inside system 50. LED 58 is connected through leads 68 to circuit board 62. LED 56 is connected to the circuit board 62 on the rear face (not shown) of circuit board 62. Battery 66 is connected through leads 72 and 74 to circuit board 62. Operation of the circuit of FIGS. 8 and 9 is essentially the same as described above in connection with FIG. 6. FIG. 10 also shows that LEDs 56 and 58 may be positioned, as shown at 56a and 58a, to direct light into connection device 50.

[0062] The advantages of the embodiment of FIGS. 7-10 are that the bulk and weight of the electronics are separated into two housings, reducing overall size, and allowing the system to be applied to many garments or other products with a high degree of visibility and attractiveness.

[0063] Connection device 60 may include discontinuities, e.g., a plurality of notches or slits 60S, which interrupt and emit light coming from LEDs 56 and 58. If the control circuit on the circuit board 62 alternately lights the LEDs 56 and 58, this produces an attractive alternate racing light effect. The same feature may be embodied in the lighting system 10 of FIGS. 1-5 if connection devices 26 and 28 have similar notches or slits.

[0064] In both the first and second embodiments, the flanges 60F and 10F of the molded housing extend outward (see FIGS. 2 and 7), to allow attachment to a garment or object by sewing through the edge region of the lighting system without piercing the system, thus maintaining the integrity of its sealing.

[0065] The concepts of FIGS. 1-10 may be applied to other toy images such as hearts (see FIG. 14), airplanes (see FIG. 19), pick-up trucks (see FIG. 20), stars (see FIG. 21), and athletic balls that are alike or differ from one another (see FIG. 22). These same concepts may also be embodied in branched, non-linear shapes such as the branched flower arrangement shown in FIG. 15, and the flower array shown in FIG. 18. In these embodiments, LEDs may be placed to cause light to be emitted from any desired area, such as from the center of hearts 130, 131, and 132 in FIG. 14, from one or more of the petals of the flowers 140, 141, 142, 143, and 144 of the flower array of FIG. 15, from the cockpits of planes 150, 151 and 152 of FIG. 19, and from the roof fixture on the pick-up trucks 160, 161, and 162 of FIG. 20. These lighting systems can be attached to garments of all kinds, such as the pants, shirt, and belt shown in FIG. 16, and to back packs, purses, and footwear.

[0066] FIG. 12A shows that lead 36 may connect to LED 24 through coiled loop, slack strain and flex relief wiring 100 to minimize the risk that lead 36 will break after repeated flexing/bending.

[0067] FIG. 13 shows that the electrical components 120, 121 and 122 of the circuitry in FIGS. 4 and 5A, 5B, and 5C can be connected with flexible circuit 104, and that the flexible circuit may include curved, stress-relief sections 101, 102, and 103 to minimize the risk of breaking circuit 104 after repeated flexing/bending. Advantageously, this relief wiring may be located in an open/void region inside a housing to allow stretching, which provides relief from stretching/bending/flexing of a garment to which the system is attached.

[0068] Other changes and modifications in the lighting systems described herein may be made without departing from the spirit and scope of the following claims.

What is claimed is:
1. A lighting system for attachment to garments, footwear, back packs, purses, belts, accessories and wearing apparel comprising:
   at least two housing portions, and connectors extending between and connecting said at least two housing
portions said connectors comprising electrical wiring, or sealed, hollow housings for electrical wiring that extend between said hollow housing portions;

one or more batteries inside said housing portions;

one or more light sources inside said housing portions for light emission through the surface of said housing;

a motion responsive switch or a user-activated switch or both inside said housing portions; and

light control circuitry connected to said battery, said switch and said light sources for controlling the activation of said light sources responsive to operation of said switch, wherein the weight and volume of said battery, light control circuitry and said switch are distributed among said housing portions.

2. The system of claim 1 wherein said housing portions are hollow, and are made of light transmitting material.

3. The lighting system of claim 1 wherein said housing portions have ornamental shapes, and are illuminated by said light sources.

4. The lighting system of claim 1 wherein said housing portions are two in number, and said battery and light control circuitry are distributed throughout said housing portions.

5. The lighting system of claim 4 wherein said housing portions each take the shape of a vehicle.

6. The lighting system of claim 6 wherein said housing portions take the shape of a locomotive and railroad cars and said light sources are distributed among said locomotive and at least one railroad car.

7. The lighting system of claim 4 wherein said light sources are distributed among said housing portions, and said housing portions take the shape of an airplane, an airport runway, and an airport control tower.

8. The lighting system of claim 1 wherein said housing portions are at least 3 in number and said battery, said light control circuitry and said switch are distributed throughout said housing portions.

9. The lighting system of claim 1 wherein light sources are inside each of said housing portions.

10. The lighting system of claim 1 wherein said light sources are LEDs.

11. The lighting system of claim 1 wherein said connector portion includes discontinuities in the surface thereof that emit light from at least one of said housing sources.

12. The lighting system of claim 1 wherein said connector portions include a channel for electrical wiring that electrically connect said battery, lighting control circuitry, switch and light sources.

13. The lighting system of claim 12 wherein said switch is inside one of said housing portions and is activated by movement of the switch.

14. The lighting system of claim 1 wherein one or more of said housing portions includes edge flanges thereon for securing said system to a garment.

15. The lighting system of claim 1 wherein said housing portions are flower-shaped.

16. The lighting system of claim 1 wherein at least one of said housing portions takes the shape of a vehicle.

17. The lighting system of claim 1 wherein said housing portions take the shape of one or more toys.

18. The lighting system of claim 1 wherein said motion responsive switch is inside one of said housing portions.

19. The lighting system of claim 18 wherein said light control circuitry is inside one of said housing portions and is electrically connected to said LEDs.

20. The lighting system of claim 19 wherein said switch and said battery are inside different housing portions.

21. A lighting system for wearing apparel comprising:

at least two sealed housing portions shaped like one or more toys, and made of flexible, light transmitting material; and, inside said housing portions, a battery; a switch; at least one light emitting source; and an electrical circuit, said switch, said light emitting source and said electrical circuit being connected to said battery such that activation of said switch causes said light emitting source to illuminate said toy.

22. The lighting system of claim 21 wherein said garment includes a sleeve, said housings are attached to said sleeve, and motion of said sleeve causes illumination of said toy.

23. The lighting system of claim 21 wherein said toy takes the shape of a truck.

24. The lighting system of claim 21 wherein said toy takes the shape of a train and a plurality of light sources are distributed along said train.

25. A system for attachment to a garment comprising: at least two discrete hollow housing units containing lighting components, and connected to one another with electrical conductors, said electrical connectors including stress relief components.

26. The system of claim 25 wherein said stress relief components are located inside one or more of said housing units.

27. The system of claim 26 wherein said stress relief components are slack regions or wiring coils in the connectors.

28. A system for attachment to a garment comprising: at least two discrete hollow housing units containing lighting components, and connected to one another with electrical conductors, said hollow housing units including potting/sealant material to insulate said components.

29. A lighting and electronic system for attachment to garments, wearing apparel, and accessories, comprising: at least two housing portions with cavities for electronic components interconnected with electrical conductors, said conductors having stress relief components at said interconnections.

30. The system of claim 28 wherein one or more of said stress relief components is located in a void region.

31. A lighting and electronic system for attachment to garments, wearing apparel, and accessories, comprising: at least two interconnected housing portions for lighting and electronic components, said housing portions including potting material to insulate said components.

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