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Sharrah et al.

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(54) **PORTABLE LIGHT WITH PLANE OF A LASER LIGHT**

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(51) **Int. Cl.**

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F21V 5/04	(2006.01)
F21V 23/04	(2006.01)
F21V 14/02	(2006.01)
F21L 4/04	(2006.01)
F21Y 115/30	(2016.01)

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CPC ***F21L 4/025*** (2013.01); ***F21L 4/045*** (2013.01); ***F21V 5/043*** (2013.01); ***F21V 14/025*** (2013.01); ***F21V 23/0414*** (2013.01); *F21Y 2115/30* (2016.08)

(58) **Field of Classification Search**
CPC F21L 4/025; F21L 4/045; F21V 5/043; F21V 14/025; F21V 23/0414
See application file for complete search history.

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(57) **ABSTRACT**

A portable light may comprise: a light body having an illumination, e.g., white, light source and a laser light source supported thereby, each source being selectively energizable for producing light; and a switch for selectively energizing the illumination light source and/or laser light source. The laser light source is configured to provide a plane of laser light, so as to create a line of laser light on objects illuminated by the plane of laser light. The laser light source may include a cylindrical lens to create the plane of laser light. The plane of laser light may be rotatable relative to the light body. A TIR optical element may also be disposed in front of the illumination light source for receiving the light produced thereby.

31 Claims, 14 Drawing Sheets

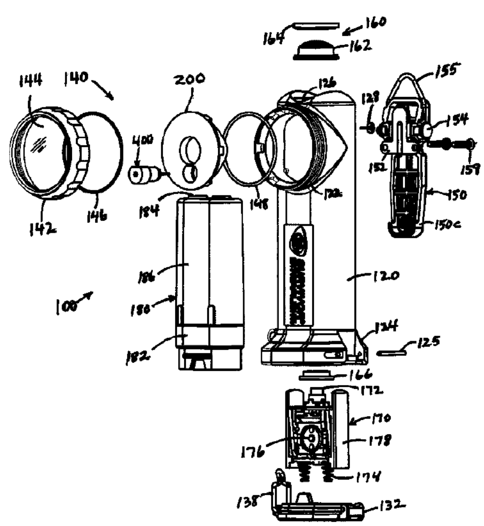

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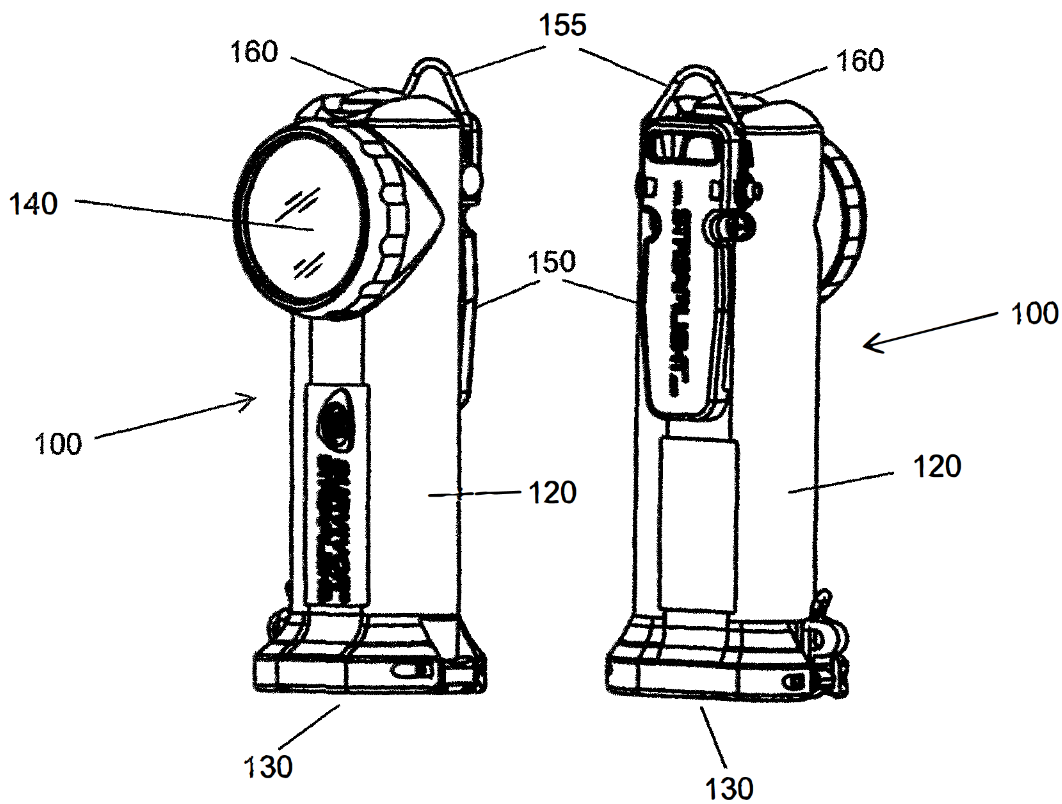
FIG.1A FIG.1B



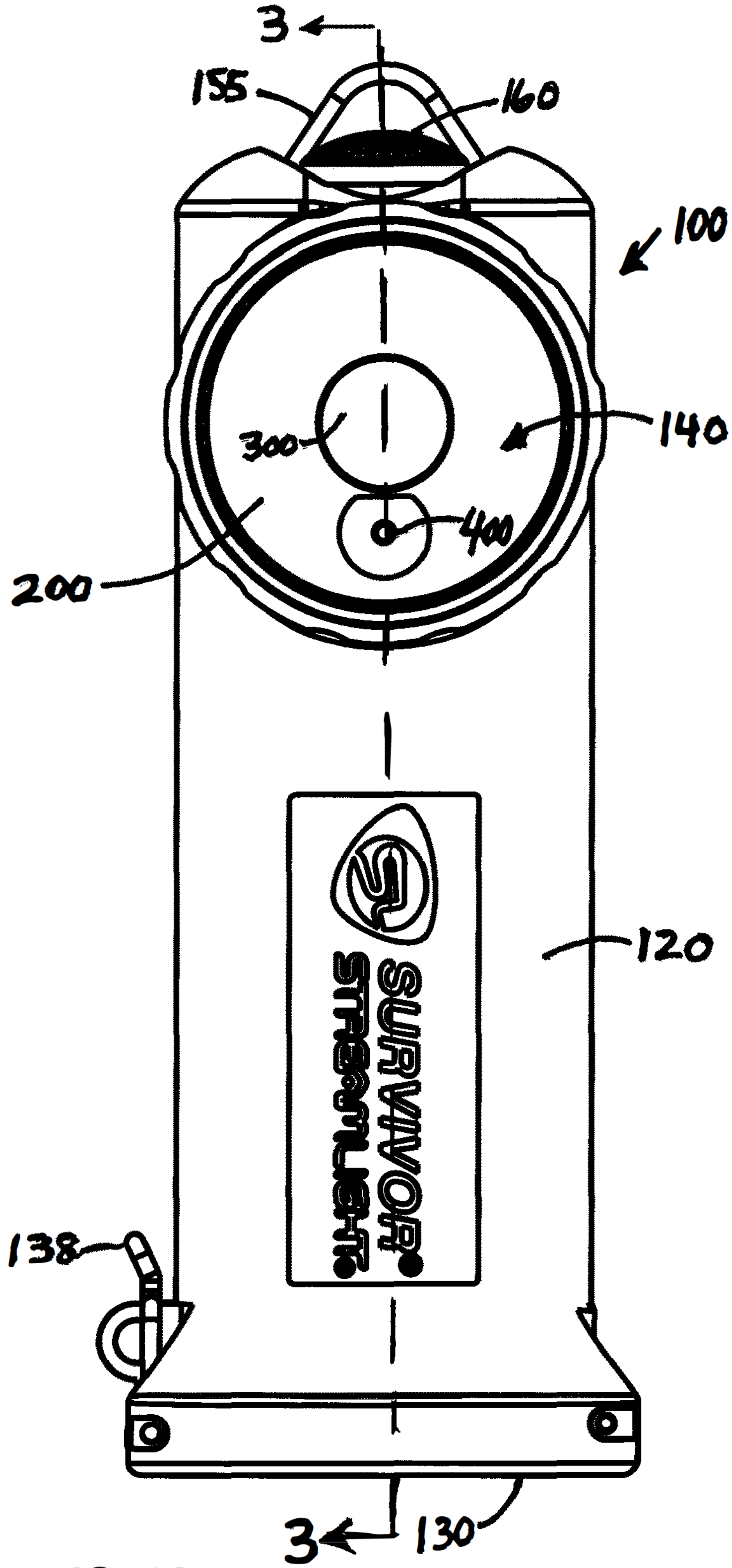

3
155
160
100
300
140
400
200
SURVIVOR
STREAMLIGHT
120
138
3
130

FIG. 1C

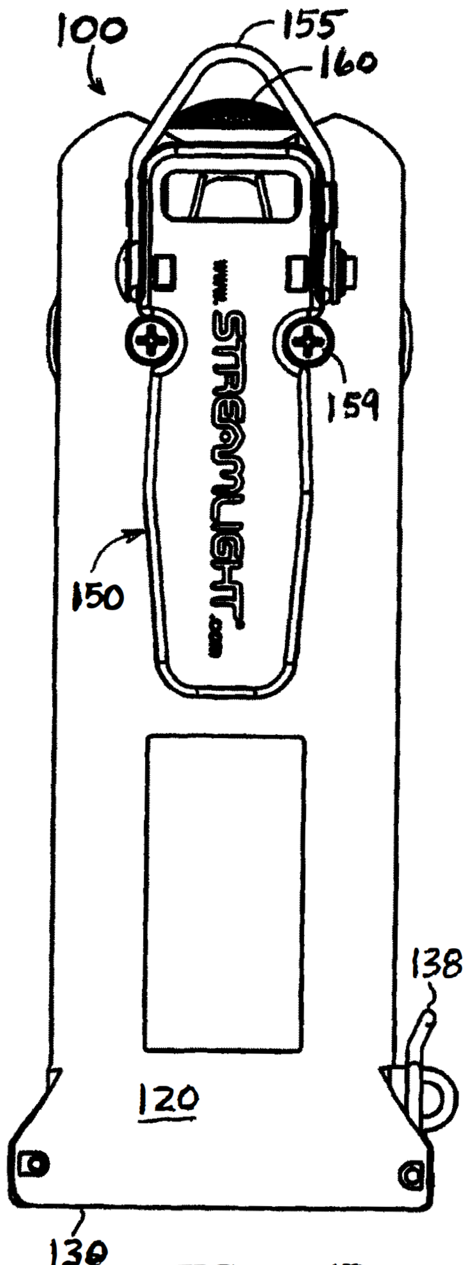


FIG. 1D

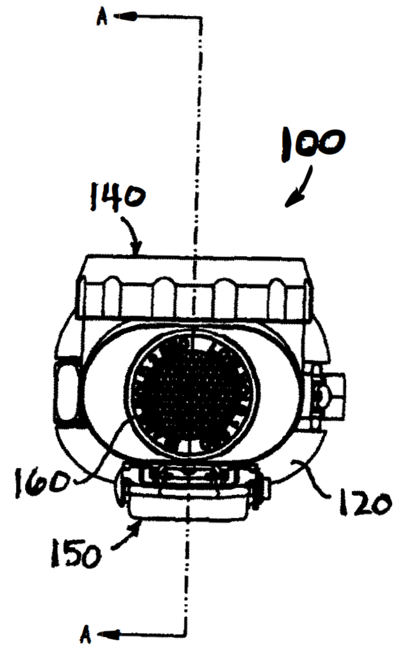


FIG. 1E

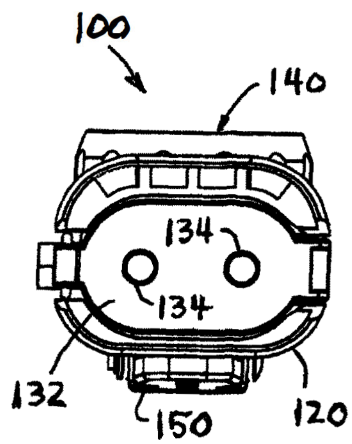


FIG. 1F

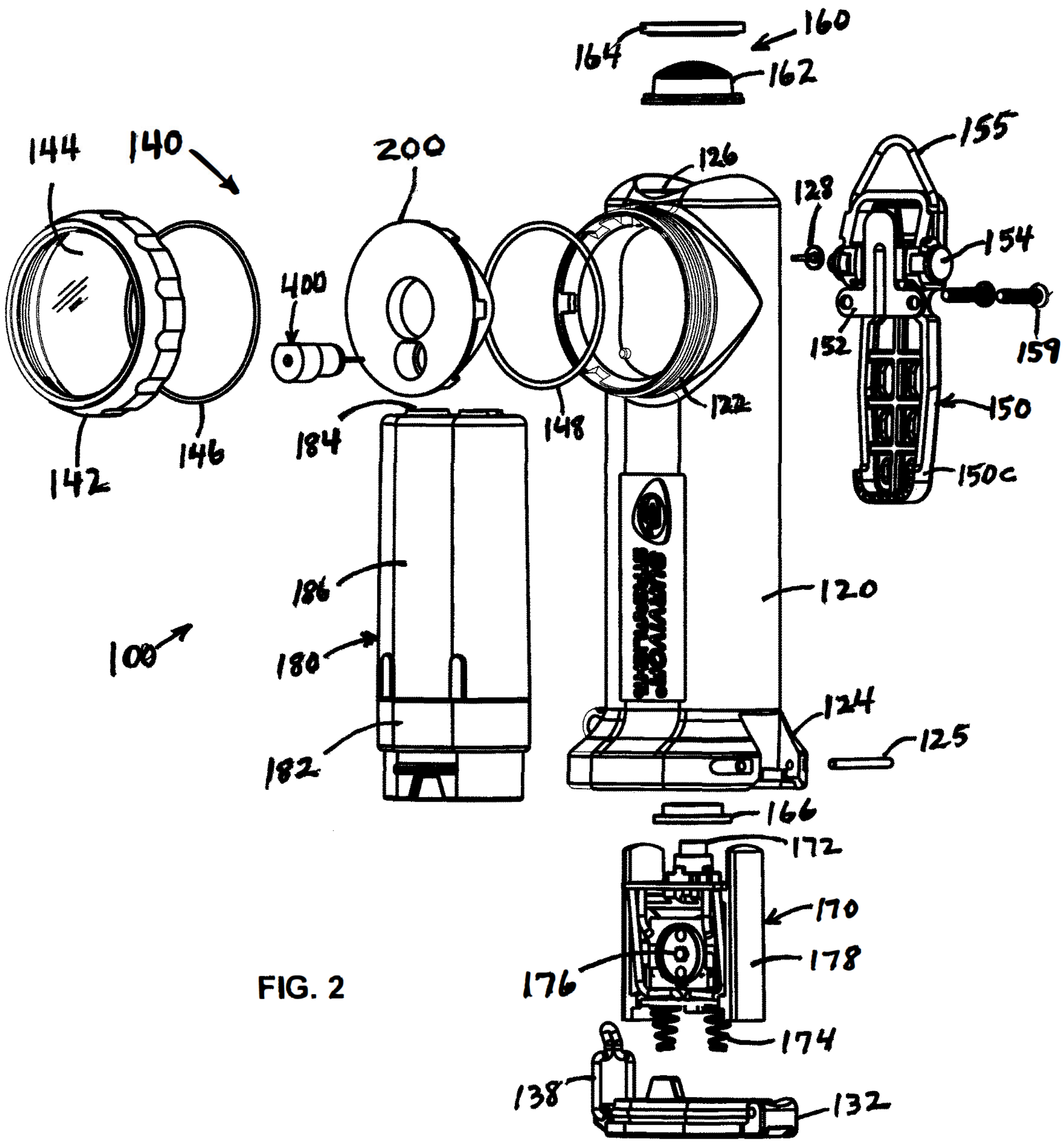
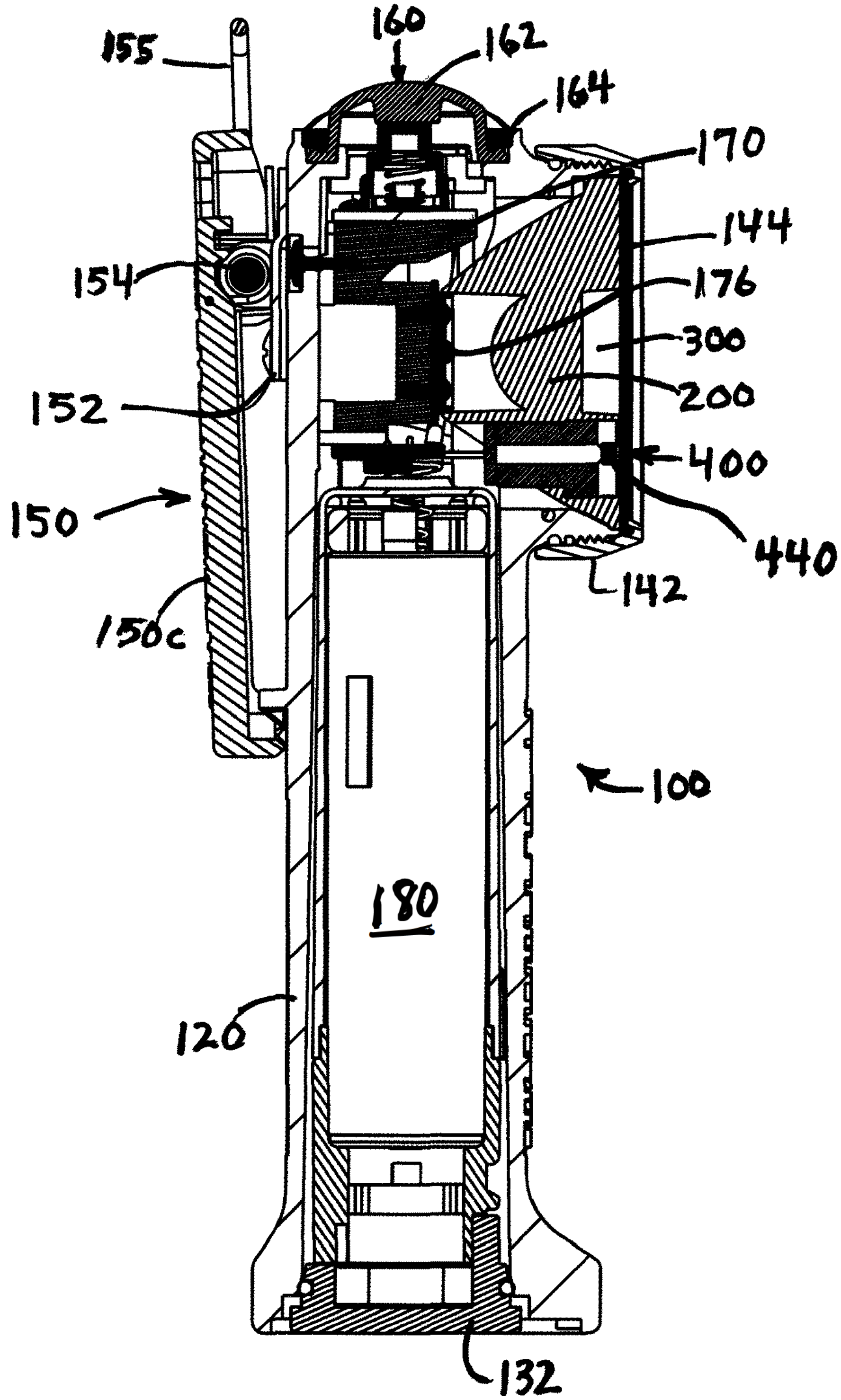

160
164
162
144
140
200
126
155
128
154
400
152
159
122
150
148
184
146
142
150c
186
120
100
180
124
125
182
166
172
170
178
176
174
138
132

FIG. 2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180
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132

FIG. 3

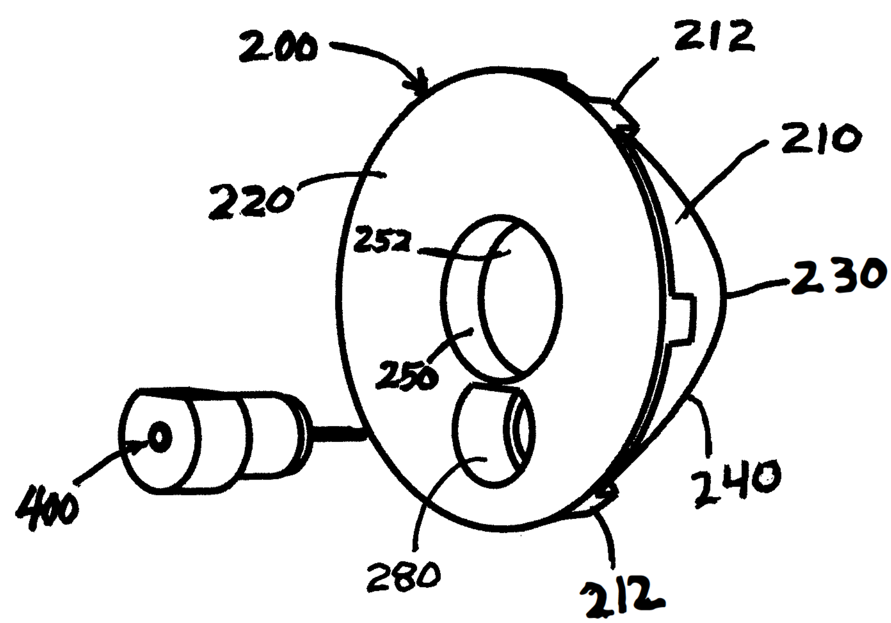
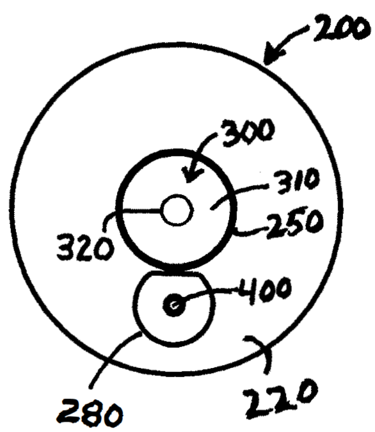
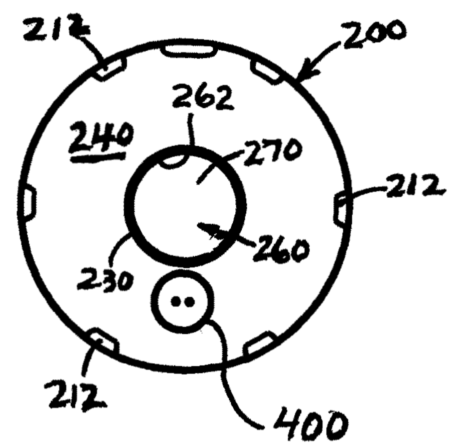


FIG. 4



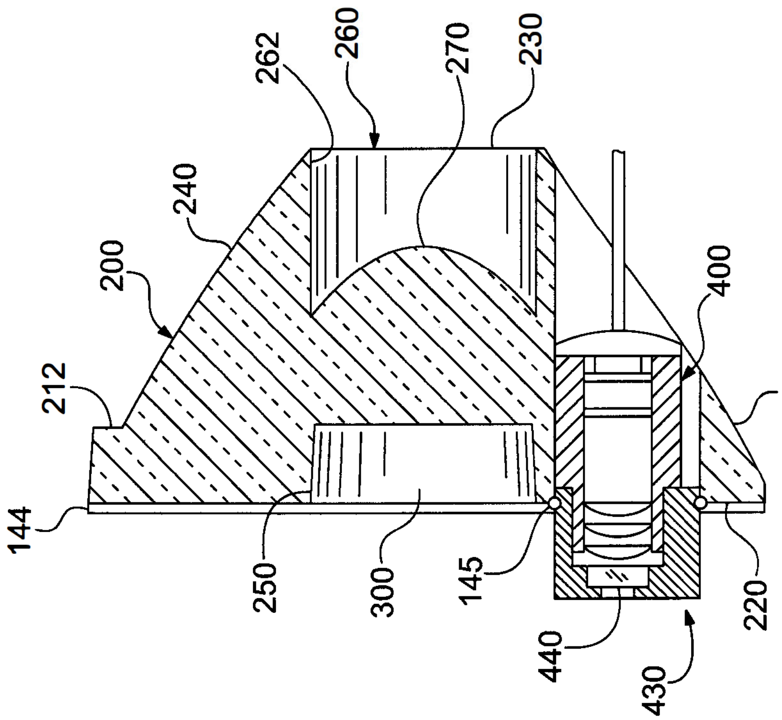
FRONT

FIG. 5A



REAR

FIG. 5B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260
270
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200
212
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144
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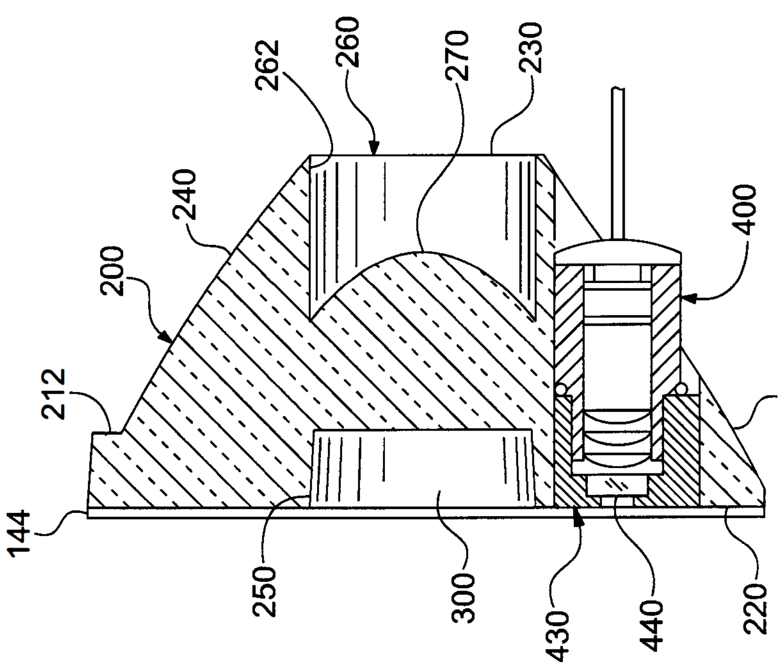
300
145
220
440
430
FIG. 5D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200
212
400
240
144
250
300
430
440
220
FIG. 5C

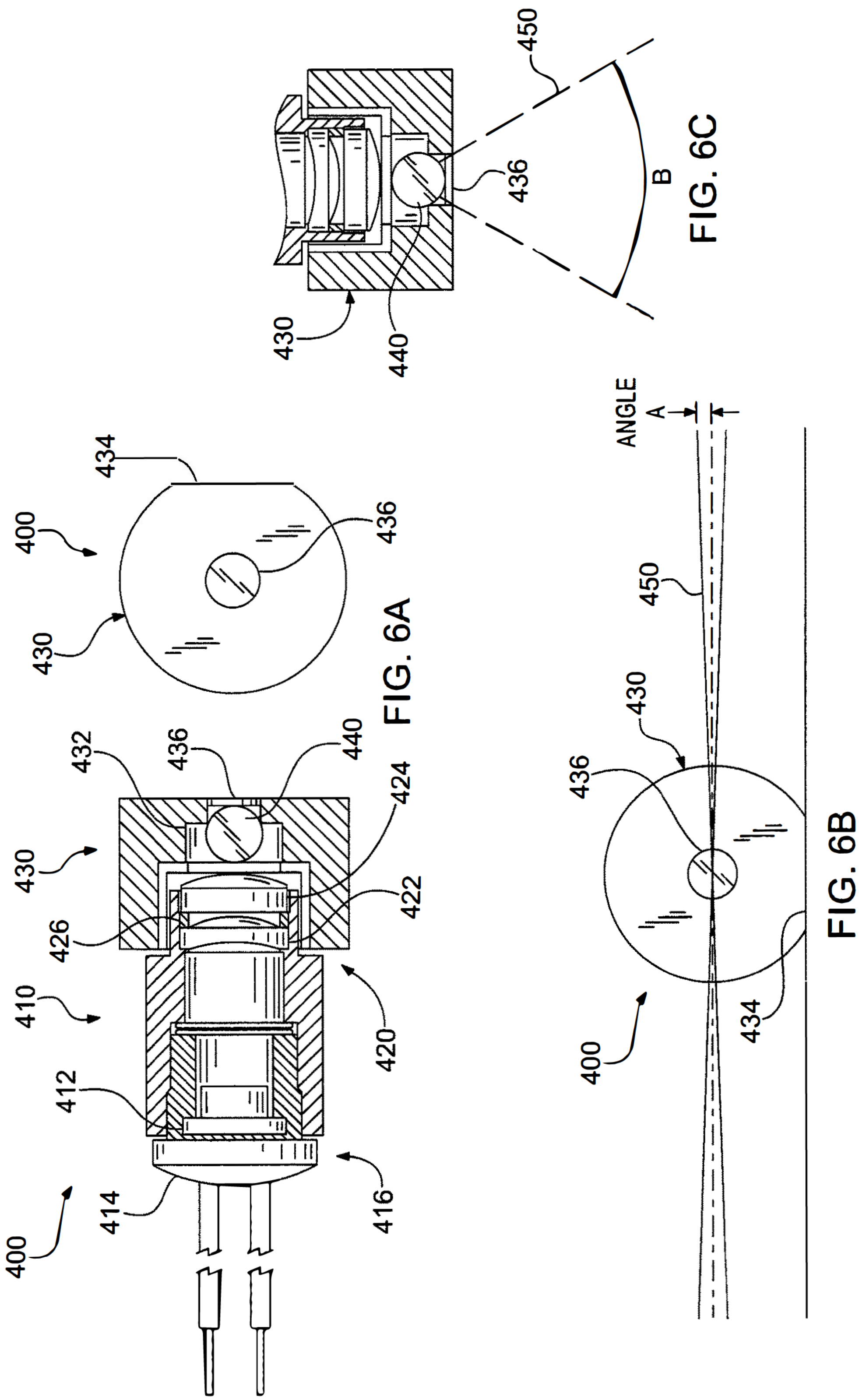


FIG. 6A
FIG. 6B
FIG. 6C

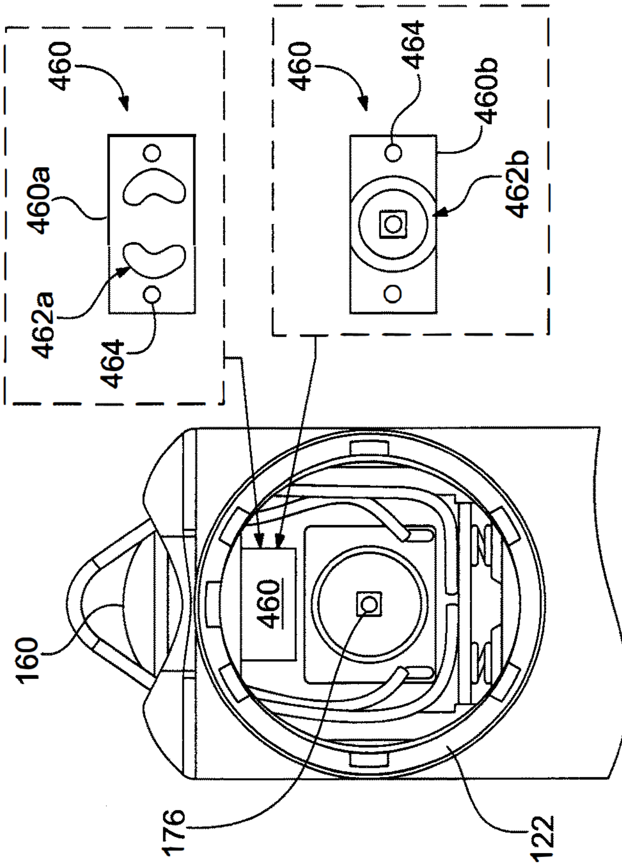

460
460a
462a
464
460
464
460b
462b
460
160
176
122

FIG. 7B

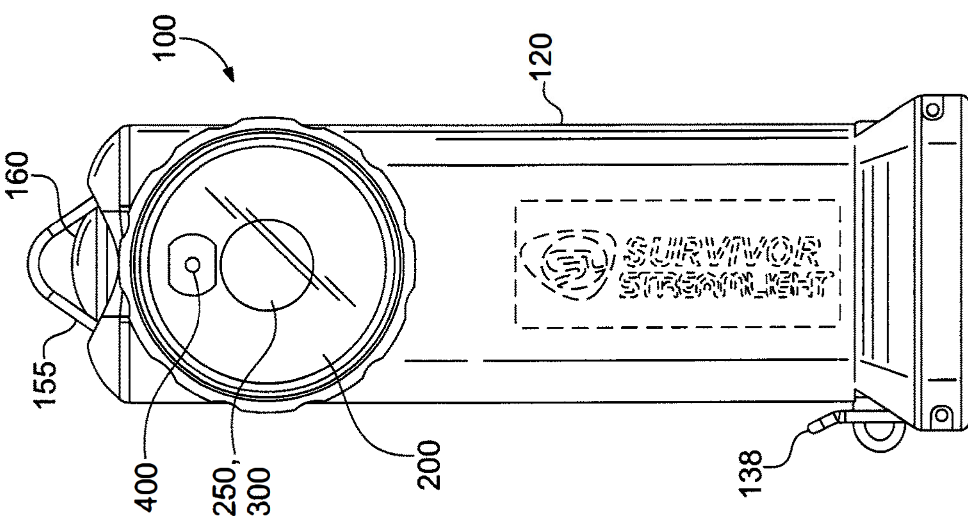
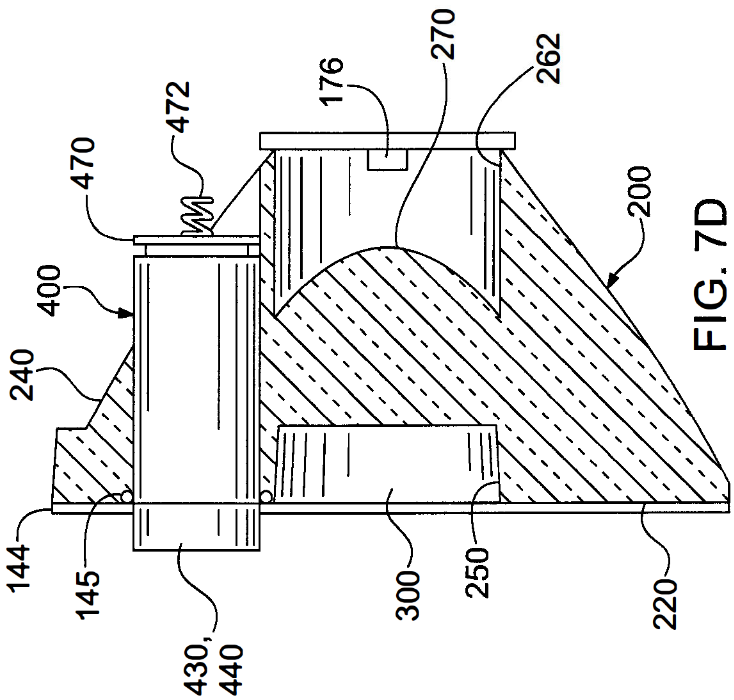
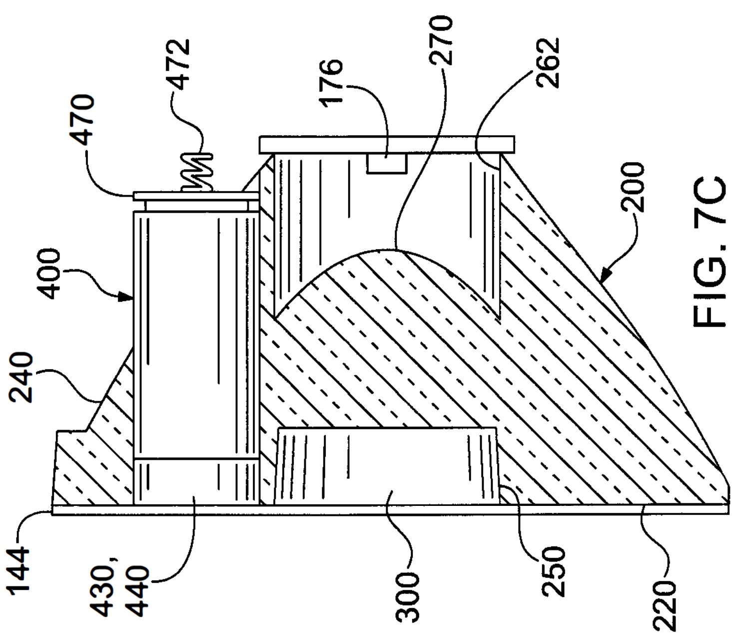

100
120
160
155
400
250,
300
200
138
130

FIG. 7A



470
472
176
270
262
200
400
240
144
145
430,
440
300
250
220

FIG. 7D



470
472
176
270
262
200
400
240
144
430,
440
300
250
220

FIG. 7C

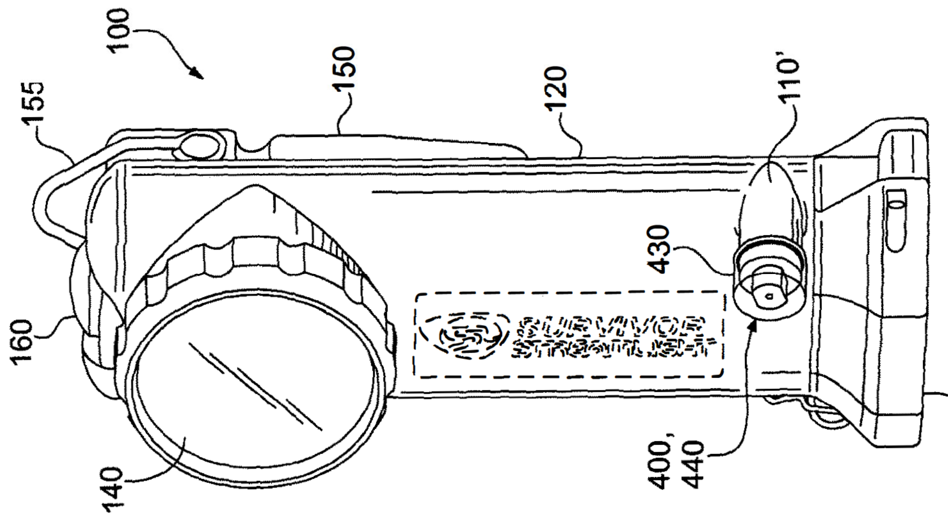
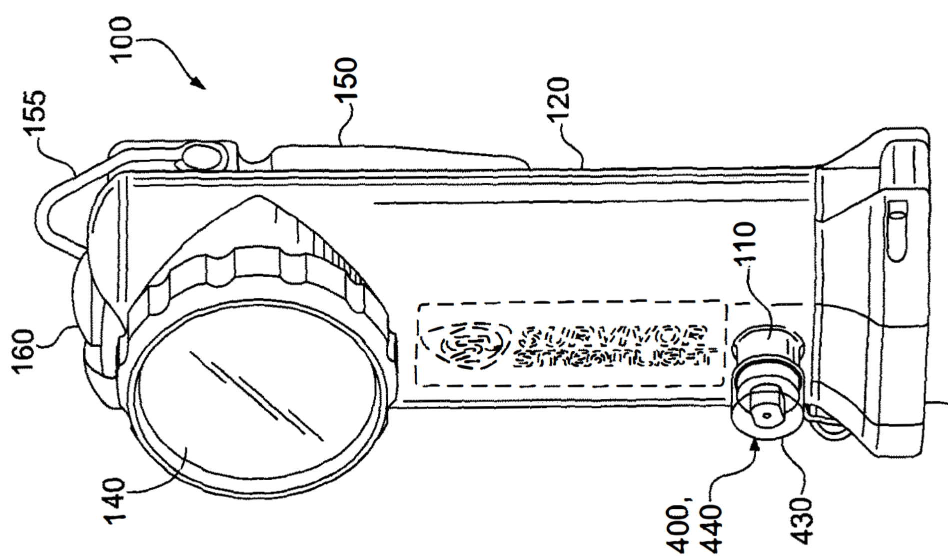

100
155
150
120
110'
160
430
140
400, 440
130
SURVIVOR
STREAMLIGHT

FIG. 8B


100
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150
120
110
160
140
400, 440
430
130
SURVIVOR
STREAMLIGHT

FIG. 8A

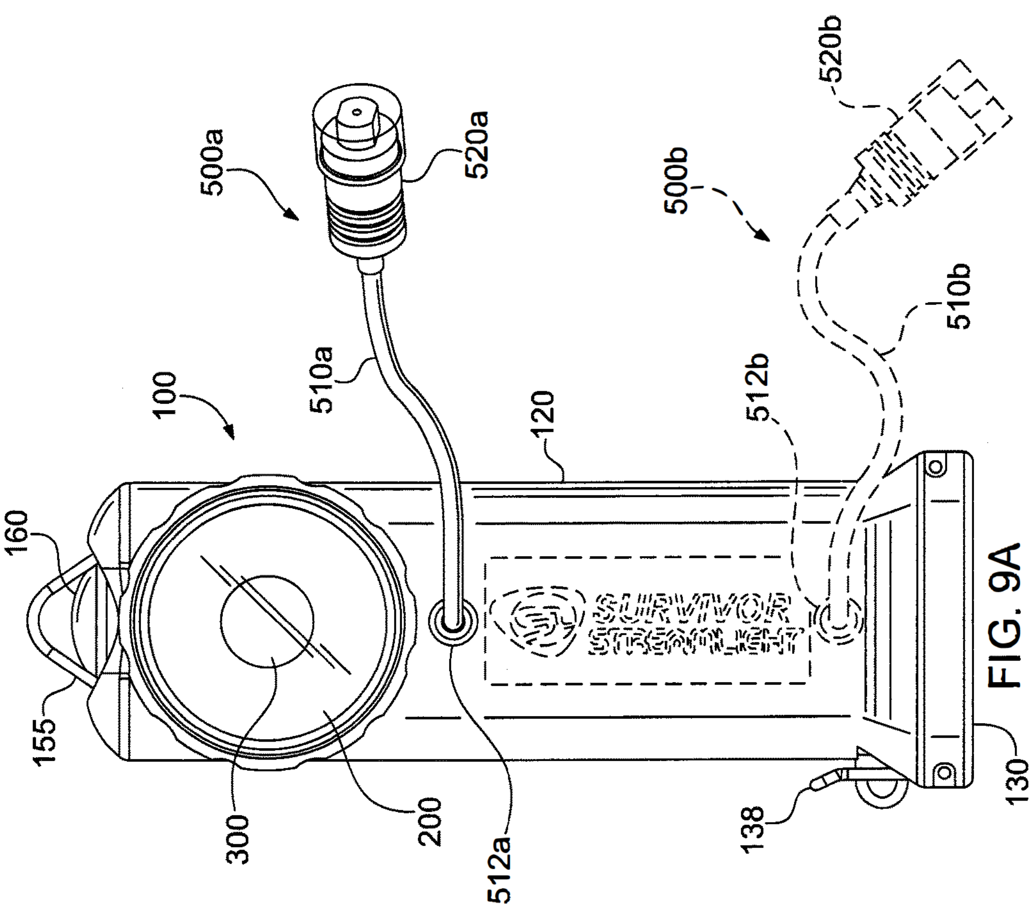
100
500a
520a
510a
512a
500b
520b
510b
512b
120
130
138
155
160
200
300
SURVIVOR
STREAMLIGHT

FIG. 9A

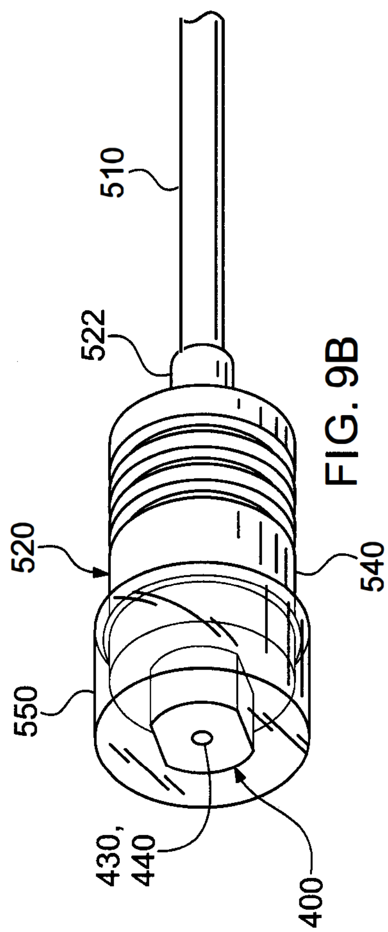
510
522
520
540
550
430,
440
400

FIG. 9B

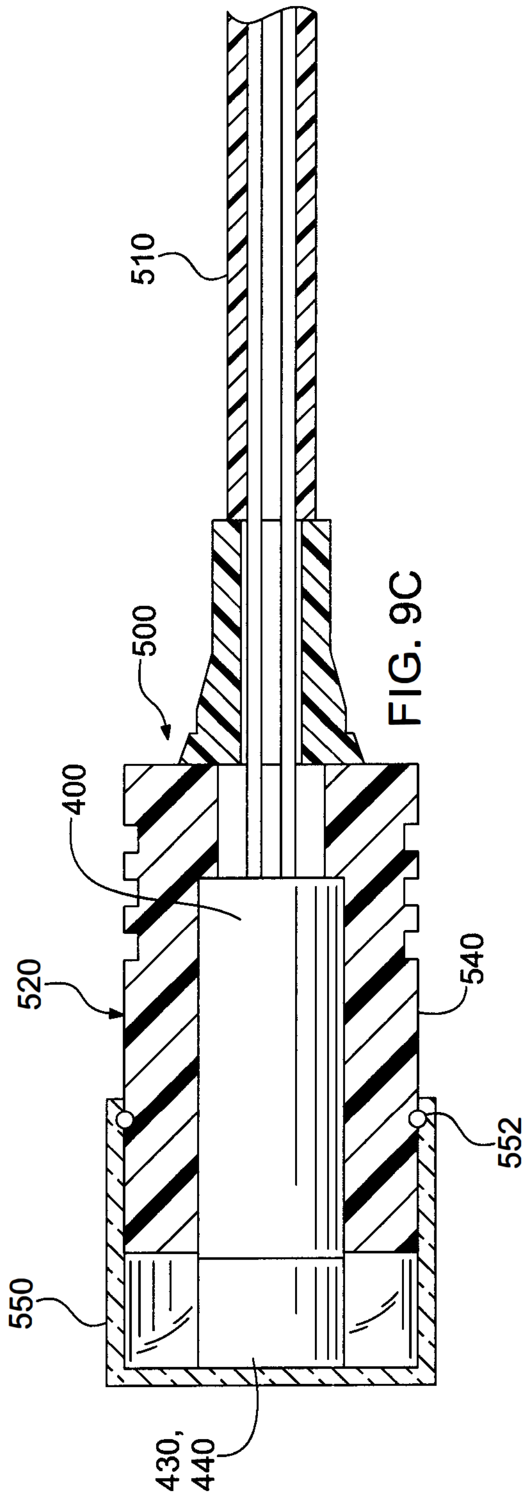
510
500
400
520
540
552
550
430,
440

FIG. 9C

PORTABLE LIGHT WITH PLANE OF A LASER LIGHT

This application claims the benefit of U.S. Provisional Patent Application No. 62/325,917 entitled "PORTABLE LIGHT WITH LASER" filed Apr. 21, 2016, which is hereby incorporated herein by reference in its entirety.

The present invention relates to a portable light and in particular, to a portable light with an illumination light source and a laser providing a plane of laser light.

Strong and reliable portable lights are important to the safety of personnel who must enter hazardous and/or dangerous locations. Lights intended for use in such locations often have special circuitry to reduce the danger from high temperatures and/or sparks, and/or have special light producing configurations that improve the ability of a user to see while in hazardous locations. Often the users of such lights may be firefighters, police, security, environmental specialists, military and other first responder personnel, as well as military and rescue personnel in such environments, who may risk health and life in such areas.

Such portable lights are used in many environments to provide illumination and to enable personnel to operate in those environments. In certain environments, visibility may be reduced by smoke, particles, fog, steam, mist, rain, snow and/or other matter suspended or floating in the air. Often these kinds of environments may be hazardous and/or dangerous to personnel, and so the reduced visibility created by such environments can increase the level of hazard and/or danger. Lights for use in these environments may include special optical elements that form and/or direct the light beam produced by the light in ways thought to improve their ability to "cut through" the particle-filled air, thereby to improve visibility.

Typically, a bright light is necessary to penetrate such environments, however, such environments tend to reflect light back towards the portable light and thereby can tend to "blind" the personnel using the portable light. Peripheral light is particularly offensive when reflected back. One way to reduce this reflection-induced blinding is to employ a highly collimated beam of light thereby to reduce any peripherally projected light.

Conventionally, lights employ a highly collimating parabolic reflector and an opaque cover, e.g., as by a black opaque area on an incandescent light source, to block peripheral light. Thus the light intensity at the center of the light beam is increased relative to the intensity at the periphery thereof.

An example of such light includes the SURVIVOR® light available from Streamlight, Inc. of Eagleville, Pa., which produces a high-intensity light formed into a relatively tight spot beam for reducing side reflected light. A recent version of the SURVIVOR® light includes a removable selectable beam modification element, which may be either opaque or colored, that fits into a recess in a solid optical element in a way to improve visibility in certain reduced and/or limited visibility environments, and which is described in U.S. Pat. No. 9,488,331 entitled "PORTABLE LIGHT WITH SELECTABLE OPTICAL BEAM FORMING ARRANGEMENT" which was issued Nov. 8, 2016, and is hereby incorporated herein by reference in its entirety.

However, when a light having a highly collimated spot beam is employed in other environments, the absence of peripheral light may be a disadvantage.

With the advent of modern high light output solid state light sources, e.g., light emitting diode (LED) light sources, a parabolic reflector is less efficient because the LED does

not emit light relatively evenly over a complete spherical volume as does an incandescent source. Typically, modern LEDs include an integral curved plastic lens so as to produce light relatively evenly over a hemispherical volume. Typically, many modern LED lights employ an optical arrangement in which internal reflection of light within an optical element is utilized to shape a forward projecting collimated light beam. Also typically, a level of peripheral light is provided by light that is directly emitted from the LED and/or by light diffusing elements to redirect light toward the periphery of the light beam. A permanent opaque plate has been employed to block the direct forward projected light from the LED.

However, even with lessening of the negative effect of peripheral light, Applicant believes there is a need for a portable light that allows individuals to better discern the physical features of environments, e.g., structures and objects therein, in a limited visibility environment, e.g., one in which smoke, mist, particles, fog, steam and/or other matter may be suspended or floating in the air.

Applicant believes there may be a need for a light that may provide improved discernment in a limited visibility environment.

Accordingly, a portable light may comprise: a light body having an illumination light source and a laser light source supported thereby, each source selectively energizable for producing light; and a switch for selectively energizing the white light and/or laser light source. The laser light source may be configured to provide a plane of laser light, so as to create a line of laser light on objects illuminated by the laser light plane. In this regard, the laser light source may include a cylindrical lens to create the light plane. A TIR optical element may also be disposed in front of the white light source for receiving the light produced thereby, and form the white light into a collimated beam of light, the TIR optical element having a recess in a forward face thereof. A selectable beam modification element may be placeable into and removable from the recess in the forward face of the TIR optical element.

Also, a portable light may comprise: an illumination light source and a laser light source supported by a light body and each selectively energizable by a switch for producing illumination light; and the laser light source may include a cylindrical lens for transmitting a plane of laser light.

Accordingly, a portable light may comprise: light body; an illumination light source supported by the light body relatively remotely to a base end thereof, configured to emit illumination light in a predetermined direction and being selectively energizable by a switch for producing illumination light; a laser light source supported by the light body relatively nearer to the base end thereof and being selectively energizable by the switch for producing laser light, wherein the laser light source includes a cylindrical lens configured for transmitting a plane of laser light in substantially the predetermined direction.

Accordingly, a portable light may comprise: a light body; an illumination light source supported by the light body and selectively energizable for producing illumination light, wherein the illumination light source includes a shaped optically clear element having a forward surface through which the illumination light exits; and a laser light source supported by the shaped optically clear element and selectively energizable for producing laser light, wherein the laser light source includes a cylindrical lens configured for transmitting a plane of laser light in substantially the same direction as the illumination light.

In summarizing the arrangements described and/or claimed herein, a selection of concepts and/or elements and/or steps that are described in the detailed description herein may be made or simplified. Any summary is not intended to identify key features, elements and/or steps, or essential features, elements and/or steps, relating to the claimed subject matter, and so are not intended to be limiting and should not be construed to be limiting of or defining of the scope and breadth of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWING

The detailed description of the preferred embodiment(s) will be more easily and better understood when read in conjunction with the FIGURES of the Drawing which include:

FIGS. **1**A and **1**B are front and rear perspective views of an example embodiment of a portable light with a laser light source, FIGS. **1**C and **1**D are front and rear views thereof, and FIGS. **1**E and **1**F are top and bottom views thereof, respectively;

FIG. **2** is an exploded perspective view of the example portable light of FIG. **1**;

FIG. **3** is a cross-sectional view of FIG. **1**C;

FIG. **4** is a perspective view of the example beam forming arrangement with a laser light source of FIG. **3**;

FIGS. **5**A and **5**B are first and second end views of the example optical beam forming arrangement with a laser light source of FIG. **4**, and FIGS. **5**C and **5**D are side cross-sectional views of the example optical beam forming arrangement with a laser light source of FIG. **4** and of an alternative embodiment thereof, respectively;

FIGS. **6**A, **6**B and **6**C are side cross-sectional, end and plan views, respectively, of an example laser light source of FIG. **4**;

FIG. **7**A is a front view of the example light illustrating an alternative position for the laser light source, FIG. **7**B is a front view of the example light with the example optical element removed, and FIGS. **7**C and **7**D illustrate alternative mounting of the example laser light source in the example optical element including for rotatability of the example laser light source;

FIGS. **8**A and **8**B are perspective views of alternative embodiments of the portable light **100** including mounting the example laser light source on the light body thereof at locations that are spaced away from the illumination light source; and

FIG. **9**A is a front view of an alternative embodiment including mounting an example laser light source on a flexible stalk that is mounted to the example portable light, and FIGS. **9**B and **9**C are a perspective view and a cross-sectional view, respectively, of the example laser light source mounted on the flexible stalk.

In the Drawing, where an element or feature is shown in more than one drawing figure, the same alphanumeric designation may be used to designate such element or feature in each figure, and where a closely related or modified element is shown in a figure, the same alphanumerical designation primed or designated "a" or "b" or the like may be used to designate the modified element or feature. Similarly, similar elements or features may be designated by like alphanumeric designations in different figures of the Drawing and with similar nomenclature in the specification. According to common practice, the various features of the drawing are not to scale, and the dimensions of the various features may be arbitrarily expanded or reduced for clarity, and any value stated in any Figure is given by way of example only.

DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

FIGS. **1**A and **1**B are front and rear perspective views of an example embodiment of a portable light **100** with a laser light source, FIGS. **1**C and **1**D are front and rear views thereof, and FIGS. **1**E and **1**F are top and bottom views thereof, respectively; FIG. **2** is an exploded perspective view of the example portable light **100** of FIG. **1**; and FIG. **3** is a cross-sectional view of the example portable light **100** including an example embodiment of an optical beam forming arrangement **200-300** with laser light source **400** therefor. Portable light **100** includes a body or housing **120** that is configured to have a base **130** upon which light **100** can rest, e.g., on a horizontal surface, and to have a light source **140** that when energized projects light in a direction substantially perpendicularly to the long axis (e.g., vertical axis) of body **120**.

Light **100** preferably, but optionally, includes a clip **150** on light body **120** by which it can be attached (e.g., clipped) to an article of clothing or to equipment or to another object, e.g., a belt or strap or rope or bar, as well as a hanger or loop **155** by which it can be attached (e.g., hung) from an article of clothing or equipment or another object. Hanger **155** is attached to light body or housing **120** by a bracket, e.g., the bracket **152** that supports clip **150**, and more specifically, hanger **155** is pivotable on the pivot or hinge pin **154** on which clip **150** pivots on that bracket **152** relative to housing **120**.

A switch actuator **160** is provided for selectively energizing and de-energizing illumination light source **140**, e.g., white light source **140**, and laser light source **400**, where the light sources **140**, **400** may be energized separately, so that only one source **140**, **400** is on at a given time. Preferably switch actuator **160** is at the upper end on body **120** where it can easily be actuated by a finger when light **100** is held in hand or can be pressed when light **100** is resting on a horizontal surface or is attached by clip **150** or hung by loop **155**. Also preferably, light sources **140**, **400** are proximate the upper end of light body **120**.

Light body or housing **120** is preferably a hollow tube **120**, e.g., a molded plastic tube, having a receptacle **1***b* for receiving elements, e.g., elements **142-148**, **176**, **200**, **300** of white light source **140** extending substantially perpendicularly from the upper end of body **120**, and having an opening **126** at the upper end thereof for receiving elements, e.g., elements **162-166**, of switch actuator **160**. A switch boot **162** of switch actuator **160** is attached over an opening **126** in the upper end of housing **120** by a switch ring **164** which is attached to housing **120**, e.g., by adhesive or by welding or by another suitable method to sealingly attach boot **162** thereto. A switch spacer **166** is disposed behind switch boot **162** for transmitting a pressing of boot **162** to actuate an electrical switch **172** which is adjacent thereto when LED module assembly **170** is inserted into housing tube **120** through the opening at the base **130** thereof and is fully seated against the upper end thereof.

LED module assembly **170** includes, e.g., a heat sink structure **178** to an upper end of which is mounted electrical switch **172** and to a lower end of which are mounted a pair of spring contacts **174** for making electrical connections to a battery assembly **180**. Heat sink structure **178** is substantially rectangular with two substantially parallel opposing sides thereof having extensions projecting upwardly and downwardly, e.g., to increase the heat sinking area and mass thereof. A preferably integral wall fills the rectangular center of heat sink **178** and thermally connects to all sides thereof and presents a mounting surface substantially in the plane of heat sink **178**. Mounted to that mounting surface of heat sink structure **178** is a light emitting diode (LED) **176**, which is also an element of illumination light source **140**. LED **176** is mounted in a position to direct light substantially outward and away from that surface of heat sink **178** and around a perpendicular to the long axis of housing **120**, e.g., into the base of optical element **200**, as described below.

Battery assembly **180** includes an inner carrier structure **182** which carries, e.g., a plurality of battery cells (not shown) and provides interconnections therebetween and an outer carrier cover **186**. Carrier **182** includes a pair of contacts **184** at its upper end, e.g., accessible through openings in the upper end of carrier cover **186**, for making electrical connection to the spring contacts **174** extending from LED module **170**. Battery assembly **180** may contain either single use battery cells or rechargeable battery cells. Where battery assembly **180** contains rechargeable battery cells, carrier cover **186** may be permanently attached to inner carrier **182**. In that embodiment, battery assembly **180** preferably also provides a pair of contacts at its lower end for making electrical connection to optional connections **134** through battery door **132**.

Battery door **132** is hinged by pin **125** engaging a clevis **124** at the base of housing **120** and preferably includes a pair of contacts **134** there through for connecting battery carrier **180** internal to light **100** to an external source of charging power, e.g., a charger base, when light **100** is placed therein for charging rechargeable batteries that may be utilized in light **100**. Battery door **132** includes a pivotable clasp **138** for securing battery cover **132** in a closed position in housing **120**, and may also include an O-ring, gasket or other seal for sealing the battery door end of housing **120**.

White illumination light source **140** may be provided by an LED **176** of LED module assembly **170** in conjunction with elements **142-148**, **200**, **300**. Optical element **200** is a shaped optically clear plastic element **210** that has a polished generally parabolic external side surface **240**, a generally wider flat polished forward surface **220**, and a shaped narrower rearward surface **230** that is disposed adjacent to LED **176** of LED module assembly **170**. LED **176** may be surrounded by a raised ring sized and shaped to receive the rearward end **230** of optical element **200**. Polished side surface **240** may be a generally parabolic surface or other suitably shaped surface to collimate the light produced by LED **176** into a desired beam, e.g., a collimated forward projecting white light beam.

Optical element **200** is covered by a lens **144** and both are retained in the threaded receptacle **122** of housing **120** by a lens ring **142**. Preferably Lens ring **142** has threads, e.g., internal threads, that engage complementary threads, e.g., external threads, of receptacle **122** for securing lens ring **142**, lens **144** and optical element **200** in housing **120**. Preferably, but optionally, an O-ring **146** grommet **146** or other seal **146**, may be provided between lens ring **142** and lens **144** to provide a seal thereat and housing **120** may have a second O-ring **148** around outer periphery of receptacle **122** for sealing between lens ring **144** and housing **120**.

Preferably, but optionally, a pivotable clip assembly **150** includes a pivotable clip **150***c* and is attached at a bracket **152** thereof to housing **120** by one or more fasteners **159**, e.g., two screws **159**. Clip assembly **150** includes the clip **150***c* which is pivotably mounted to bracket or base **152** by a pivot pin **154**, and has hanger or loop **155** that is pivotable by the ends thereof pivotably engaging hinge pin or pivot pin **154** on which clip **155** pivots. Housing **120** may be provided with a pressure relief valve **128**, typically a resilient valve **128**, disposed in an opening in housing.

FIG. **4** is a perspective view of the example beam forming arrangement **200** of FIG. **3**; FIGS. **5**A and **5**B are first and second end views of the example optical beam forming arrangement **200** with a laser light source **40** of FIG. **4**, and FIGS. **5**C and **5**D are side cross-sectional views of the example optical beam forming arrangement **200** with a laser light source **400** of FIG. **4** and of an alternative embodiment thereof, respectively. Optical element **200** is a shaped optically clear plastic element whose optically clear body **210** has a curved polished side surface **240**, a generally wider flat polished forward surface **220**, and a narrower rearward shaped surface that is disposed adjacent to LED **176** of LED module assembly **170** as described. Light, typically white light, produced by LED **176** enters optical element **200** through the rearward end **230** thereof, is essentially totally internally reflected therein to form a highly collimated beam of light, and exits optical element **200** at the flat forward exit surface **220** thereof. Thus the totally internally reflective (TIR) optical element **200** serves to redirect the rays of light emitted by LED **176**, which are emitted therefrom substantially radially into a substantially hemispherical volume, into substantially parallel rays of light defining a highly collimated beam of light that exits forward surface **220** of optical element substantially parallel to the central axis, e.g., the axis of optical symmetry, thereof.

More specifically, light emitted by LED **176** impinges on and is refracted by the side wall of the rearward cylindrical recess **260** and into the body **210** of optical element **200** wherein it is totally internally reflected (TIR) by external curved surface **240** to exit via the flat forward face **220** thereof as a highly collimated beam. While most of the light entering via the side wall **262** of cylindrical recess **260** is believed to come directly from LED **176**, LED **176** is not a true point source and so some rays may be reflected by surface **270** towards side wall **262**. Because optical element **200** is highly efficient in collecting and in internally reflecting and collimating the light emitted by LED **176**, very little light is emitted toward the periphery of optical element **200**.

A substantially cylindrical recess **260** at the rearward end of optical element **200** has a curved convex bottom **270** for refracting light from LED **176** into optical body **210** in a direction towards the bottom **252** of cylindrical recess **250** in the flat forward surface **220** thereof, from which it exits optical element **200**. Preferably, the light exiting optical element **200** is diffused through the textured bottom surface **252** of recess **250** to provide peripheral light. The cylindrical recess **250** provided in the flat forward face **220** of optical element **200** in an available embodiment thereof has a flat textured bottom surface **252** so as to diffuse light from LED **176** that impinges upon surface **252** thereby to provide the peripheral light.

Because peripheral light is sometimes desirable and sometimes is not desirable, Applicant provides a selectable beam modification element **300** that enables a user to easily reconfigure portable light **100** to provide the desired level of peripheral light. A removable beam modification element **300**, e.g., a removable plug element **300**, may be disposed in the cylindrical recess **250** in the forward surface of optical element **200**, whereat is can block or otherwise modify one or more characteristics of the light exiting through surface **252**, e.g., which can provide peripheral light. Preferably removable beam modification element **300**, e.g., removable plug element **300**, has an opaque body or base **310** so as to maximize the peripheral light that it blocks.

It has been found that if the peripheral light is amber in color, it can be less objectionable and less fatiguing to a user than is white peripheral light, at least in some environments. Accordingly, a removable beam modification element **300**, e.g., removable plug element **300**, that has a body **310** of transparent or translucent amber colored material, e.g., plastic, may be provided, either in place of and/or in addition to an opaque plug **300**, to modify the color or the intensity or both of the peripheral light, e.g., to be amber in color.

One example embodiment of removable beam modification element **300**, e.g., removable plug element **300**, preferably comprises an opaque cylindrical body **310** having a diameter that is slightly smaller than the diameter of the cylindrical recess **250** in the forward face of optical element **200** and being of lesser thickness than the depth thereof.

Intuitively, one might expect that placing an opaque beam modification element **300** directly in front of LED light source **176** would substantially diminish the light intensity at the center of the light beam emitted by light **100** and would have little effect upon the intensity of peripheral light, which beam modification element **300** does not appear to be in position to affect. Surprisingly, however, Applicant has found that the light intensity of the light near the center of the emitted light beam is not substantially diminished by beam modification element **300** while the intensity of the peripheral light is substantially diminished or otherwise modified.

Optical element **200** may include on optical body **210** thereof one or more orientation defining features **212**, e.g., one or more projections **212**, that may engage one or more corresponding orientation features, e.g., one or more recesses, in the housing **120**, **122** into which optical element **200** is placed. Where the orientation of optical element **200** in housing **120**, **122** is desired to be a particular orientation, then orientation features **212** may be arranged in a non-symmetrical pattern.

Selectable beam modification element **300** is preferably of a size and shape corresponding to that of the recess **250**, preferably a cylindrical recess, e.g., recess **250**, in the forward face of optical element **200** so that it can easily be placed into that recess and can easily be removed from that recess, thereby to reconfigure portable light **100** to produce a lesser and a greater level of peripheral light. Typically, and preferably, the base of selectable beam modification element **300** may be a cylindrical disk having a diameter that is slightly less than that of the cylindrical recess of optical element **200**, and having a thickness (or length) that may be the same as, less than or greater than the depth of the cylindrical recess.

Preferably, but optionally, removable beam modification element **300** may have a raised gripping member **320**, e.g., a raised ridge **320** or a sphere **320** on a short post, so that removable beam modification element **300** may easily be gripped and removed from the cylindrical recess **250** in optical element **200**.

Selectable beam modification element **300** may be removably retained in the recess **250** of optical element **200** in any one or more of a variety of different arrangements. For example, selectable beam modification element **300** may be removably retained in the recess of optical element **200** by friction, or may have a resilient periphery that contacts the inner surface of the recess **250** in optical element **200**, or may be of a resilient material and of a diameter to contact the inner surface of the recess **250** in optical element **200**, or may have an O-ring in a peripheral groove that contacts the inner surface of the recess **250** in beam modification element **300**, or may be retained by pressure where the difference between the diameters of selectable beam modification element **300** and the recess **250** are small. In the illustrated embodiment, selectable beam modification element **300** is retained by a cover provided by lens **10** and lens ring **11**, however, a cover of a different form, e.g., a press in or snap in cover, may also be employed.

Further, selectable beam modification element **300** may be opaque or may be transparent or translucent and of any desired color, or plural different beam modification elements **300** may be provided with light **100**. For example, selectable beam modification element **300** may be of a transparent amber colored material so that the peripheral light is amber in color which is believed to be less fatiguing when reflected by smoke or other particulates in an environment. The intensity of the peripheral light is directly related to the light transmissibility of the material from which selectable beam modification element **300** is made, and so the material employed may be selected to provide a desired level of peripheral light intensity. Further, selectable beam modification element **300** may be of materials of other colors, e.g., red, blue, green, yellow and the like, as may be desired for coloring the peripheral light for a given environment and/or preference, or for merely distinguishing by its color one light **100** from another light **100**.

As a result of selectable beam modification element **300** being removably retained in optical element **200**, portable light **100** is easily configurable and reconfigurable by a user to produce a beam of light having a lesser peripheral light intensity or a greater peripheral light intensity, as well as to configurations producing peripheral light of different colors and/or intensities.

In addition, because white light is sometimes not desirable, Applicant also provides laser light source **400** that may be configured to provide a plane of laser light to illuminate objects in a reduced visibility environment, such as a smoke-filled room. FIG. **6**A is a side cross-sectional view of the example laser light source **400**, and FIGS. **6**B and **6**C are an end view and a plan view, respectively, of the laser light source **400** showing the light plane **450**. Laser light source **400** includes a laser emission element **410**, a laser lens assembly **420** and a lens supporting element **430** in which is disposed a cylindrical lens **440**.

The laser light source **400** may include a cylindrical lens **440** for receiving light from a laser emission element **402**, such as a red laser diode, and for transmitting the received light as the plane of laser light **450**. The laser light source **400** may include a registration feature **434** on an external surface thereof disposed in registration with a longitudinal axis of the cylindrical lens **440**. In particular, the registration feature **434** may have an axis oriented perpendicular to the longitudinal axis of the cylindrical lens **440** whereby the plane of laser light **450** is substantially parallel to the flat surface of registration feature **434**.

The laser light source **400** may be mounted to the flat forward exit surface **220** interior to the optical element **200**, e.g., in a recess **280** therein. One might also expect that placing the laser light source **400** in the path of LED light source **176** would substantially diminish the light intensity of the white light beam emitted by light **100**. Surprisingly, however, Applicant has found that the light intensity of the light of the emitted white light beam is not substantially diminished by the presence of laser light source **400** in the recess **280** of TIR optical element **200**, **210**. Perhaps the light from LED **176** traveling in TIR optical element is reflected at the interface of recess **280** to remain within optical element **280** until it exits at flat front surface **220**.

In an example laser light source **400**, the laser assembly **410** includes a sleeve or housing **416** that supports a laser emitting element **412** on an electronic circuit board **414** to emit laser light toward laser lens assembly **420**. Laser lens assembly **420** includes lenses and baffles, such as first focus lens **422** and second focus lens **424** with a baffle **426** therebetween, so as to form the laser beam from emission element **412** into a tightly focused spot beam. Typically, one or more electrical wires exit at the rear of housing **416** for providing electrical connections for energizing laser emitting element **412**.

A cylindrical lens supporting element **430** is disposed at the forward end of laser assembly **410** for supporting a cylindrical lens **430** in a lens seat **432** therein and has an aperture **436** through which the plane **450** of laser light exits laser light source **400**. Lens seat **432** seats cylindrical lens **430** in a predetermined orientation relative to the flat registration feature **434** on the exterior surface of lens support **430** and laser light source **400** so that the orientation of the plane **450** of laser light emanating from cylindrical lens **440** and laser light source **400** is in a predetermined orientation relative to registration feature **434**. Lens support **430** has a lens cup at the rearward end thereof into which laser lens assembly **420** is disposed, thereby to predetermine the relative positions thereof so that the exit of lenses **420**, **422**, **424** is closely adjacent to cylindrical lens **440** and to reduce the overall length of laser light source **400**.

In the example illustrated, cylindrical lens **440** is seated in lens seat **432** of support **430** so that its longitudinal axis is perpendicular to the registration feature **434** so that the plane **450** of laser light exiting cylindrical lens **440** is substantially parallel to the flat surface of registration feature **434**.

Consequently, because the orientation of the plane **450** of laser light emitted from laser light source **400** is in a predetermined orientation relative to registration feature **434** thereof, the mounting of laser light source **400** in light **100** can be in a predetermined orientation relative to light **100**. In the example illustrated, with light **100** resting on a horizontal surface on its base **130** so that its longitudinal axis is vertical, the flat registration feature of recess **280** of TIR optical element **200** is substantially horizontal, whereby the flat registration feature **434** of laser light source **400** is substantially horizontal as is the plane **450** of the laser light emitted therefrom. With the plane **450** of laser light being substantially horizontal, it is likely to illuminate substantially vertical features, e.g., walls, doorways, posts and openings in the floor. A user of light **100** could move light **100**, e.g., by rotating its longitudinal axis away from vertical, so as to change the orientation of laser light plane **450** to a different, e.g., non-horizontal, orientation where it may better define physical features, objects and structure in a reduced visibility environment.

While laser light source **400** is illustrated as projecting a plane **450** of laser light outwardly in a direction that is generally transverse to the longitudinal axis of housing **120**, laser light source **400** may be angled such that the plane **450** of laser light is substantially parallel to the axis at which light is emitted by illumination light source **140** or may be angled, e.g., downwardly, to diverge from the illumination light. The latter is thought to make it easier for a user to discern objects in certain reduced vision environments, as is the embodiments wherein laser light source **400**, and the plane **450** of laser light therefrom, may be rotated by a user.

The plane **450** of laser light may also be referred to as a line of laser light, e.g., because it appears as a line on objects upon which it impinges and/or because the laser module **400** may be described as providing a line of laser light and/or may be employed to provide a line of laser light. The laser light from laser module **400** appears as a line, e.g., as viewed in FIG. **6**B, and appears as a triangular plane, e.g., as viewed in FIG. **6**C.

FIG. **7**A is a front view of the example light **100** illustrating an alternative position for the laser light source **400**, FIG. **7**B is a front view of the example light **100** with the example optical element **200** removed to render a portion of the interior thereof visible, and FIGS. **7**C and **7**D illustrate alternative mounting of the example laser light source **400** in the example optical element **200** including for rotatability of the example laser light source **400**. Therein, laser light source **400** is supported by optical element **200** in a position that is between recess **250** for beam modification element **300** and actuator **160**, e.g., such that the laser light source **400** is above recess **250** for beam modification element **300** when light **100** is resting with its base **130** on a surface, or when it is hanging by hanger or loop **150**. Otherwise portable light **100** is substantially as previously described.

With the optical element **200** and laser light source **400** removed as illustrated in FIG. **7**B, a portion of the interior of light **100** is visible. LED light source **176** is supported by LED module assembly **170** and above LED **176** is seen an electrical circuit board **460** that is, e.g., also supported by module assembly **170**, has connections **464** to the source of electrical power for laser light source **400**, and has an arrangement of contacts **462** configured for making contact with electrical contacts **472** at or near the rear of laser light source **400**. Laser light source **400** may include a small circuit board **470** to which the electrical wires from laser light source connect and which has one or more, e.g., two, electrical contacts **472** extending rearwardly so as to make physical and electrical contact with contacts **462** of circuit board **460** when optical element **200** with laser light source **400** therein is disposed in the receptacle **122** therefor in light housing **120**. Preferably, contacts **472** each comprise an electrically conductive spring **472**, e.g., a cylindrical or helical or conical spring **472**.

Where laser light source **400** is mounted in a fixed orientation in optical element **200**, circuit board **460** is a circuit board **460*a*** which has two side-by-side electrical contacts **462*a***, e.g., one for making contact with a respective one of side-by-side spring contacts **472**, e.g., approximately at "3-o'clock" and "9-o'clock" positions on circuit board **470**. To allow for tolerance, contacts **462*a*** may be made, and preferably are made, larger than is needed to receive the ends of contact springs **472**. In one example embodiment, electrical contacts **462*a*** are wider than the ends of contact springs **472** and have opposing complementary arcuate shapes so as to accommodate any rotational tolerance in the mounting of laser light source **400** and/or circuit board **470** thereon, as well as any alignment tolerances of spring contacts **472**.

Where laser light source **400**, or at least the end cap **430** thereof that supports cylindrical lens **440**, is rotatable in optical element **200**, circuit board **460** is a circuit board **460*b*** which has two electrical contacts **462*b***. One contact **462*b*** is centrally located on circuit board **460**B for making contact with one of spring contacts **472** that is centrally located on circuit board **470** and one contact **462*b*** being a ring-shaped contact **462*b*** surrounding the centrally located contact **462*b*** for making contact with a second one of spring contacts **472** that is spaced apart from the central contact **472** by a distance substantially equal to the radius of the ring contact **462*b***. To allow for tolerance, contacts **462*b*** may be made, and preferably are made, larger than is needed to receive the ends of contact springs **472**. In one example embodiment, both electrical contacts **462**B are wider than are the ends of contact springs **472** so as to accommodate any rotational and/or diametrical tolerance in the mounting of laser light source **400** and/or circuit board **470** thereon, as well as any alignment tolerances of spring contacts **472**.

In FIG. **7**C laser light source **400** is supported by optical element **200** behind the lens **144**, similarly to that previously described. In FIG. **7**D laser light source **400** is supported by optical element **200** such that the forward portion **430** of laser light source **400**, e.g., the cylindrical lens supporting element **430**, extends through an opening in lens **144** so as to be graspable by a user's fingers. In this arrangement, both the exterior cylindrical surface of supporting element **430** and the internal cylindrical wall of recess **280** are not flattened or otherwise keyed to fix their relative orientation, but are cylindrical. A key, stop or detent may, however, be provided for limiting the rotation of laser light source **400** in recess **280**, e.g., to less than +60° or less than +45° or another desired limit.

The protruding forward end **430** may be for rotating either laser light source **400** or for rotating only the forward portion **430** thereof which supports cylindrical lens **440**, whereby a user may conveniently change the orientation of the plane of laser light **450** relative to light housing **120** because the cylindrical lens **440**, e.g., the longitudinal axis thereof, rotates with the forward portion **430**. As a result the plane of laser light **450** may be rotated relative to housing **120** of portable light **100**, and thus when the orientation of light **100** is not changed, the plane of laser light **450** may be rotated relative to a location wherein portable light **100** is utilized, whether portable light **100** is held by the user, attached to the user by a clip **150**, or placed, e.g., with its base **130**, on a surface.

Preferably, the opening in lens **144** in which laser light source **400** resides is sealed, e.g., by an O-ring, grommet, or other sealing element **145**, thereby to resist the entry of moisture, dirt and debris into light **100**. In addition, it is preferred that a covering lens be provided over the opening **436** in forward portion **430** of laser light source **400** when it is not covered by lens **144**, thereby to resist the entry moisture, dirt and debris towards cylindrical lens **440** therein.

FIGS. **8**A and **8**B are perspective views of alternative embodiments of the portable light **100** including mounting the example laser light source **400** on the light body **120** thereof at locations that are spaced away from the illumination light source **140**. Since illumination light source **140** is proximate the upper end of light housing or body **120**, laser light source **400** can be at any location on housing **120** that is under illumination light source **140**, i.e. closer to base **130** thereof. In general, in this embodiment, it is preferred that laser light source **400** be located away from illumination light source **140**, e.g., to be close to base **130**, e.g., as close as practicable.

In the illustrated embodiment of example portable light **100**, the flared lower portion of housing **120** and base **130** at the bottom end thereof are configured to interface with, e.g., slide into, a standard charging device, e.g., an existing charging device that is compatible with several previous embodiments of the illustrated light (without the laser light source **400**) and with several other lights that have been and/or are available. Accordingly, it is desirable to not interfere with the arrangement of that charger interface and so laser light source is preferably disposed in a receptacle **110**, **110'** that extends from light body **120** above the flared lower part thereof. Were that not the case, laser light source could be located closer to the bottom of light **100**, e.g., at base **130**.

Accordingly, laser light source **400** is preferred to be provided in a location slightly above the flared part of housing **120** as illustrated, but could be located at any desired location on light body **120** from which the plane **450** of laser light would be projected in the same general direction as is the light from illumination light source **140**.

Tubular receptacle **110** may extend forwardly from the same face of light body **120** as does illumination light source **140** thereby to provide illumination light and a plane **450** of laser light in the same general direction. Laser light source **400** may be in a fixed orientation in receptacle **110** so that the orientation of plane **450** of laser light is fixed in a predetermined direction, e.g., generally parallel to the axis of light from illumination light source **140** or diverging therefrom downward towards base **130**. Laser light source **400** may have its forward end extending from tubular receptacle **110** so that it may be grasped and rotated by a user, in similar manner to that described herein, to rotate the plane **450** of laser light relative to light body **120**.

Alternatively, tubular receptacle **110'** may extend forwardly from a side face of light body **120** thereby to provide illumination light and a plane **450** of laser light in the same general direction. Laser light source **400** may be in a fixed orientation in receptacle **110'** so that the orientation of plane **450** of laser light is fixed in a predetermined direction, e.g., generally parallel to the axis of light from illumination light source **140** or diverging therefrom downward towards base **130**. Laser light source **400** may have its forward end extending from tubular receptacle **110'** so that it may be grasped and rotated by a user, in similar manner to that described herein, to rotate the plane **450** of laser light relative to light body **120**.

Because light body **120** contains a source of electrical power, e.g., a battery, tubular receptacle **110** or **110'** would project forward from body **120** so as to not interfere with the internal battery. Typically, the battery includes a number, e.g., four, of battery cells, that are preferably in a battery carrier in which the battery cells may be permanently contained or may be replaceable. The battery may be single use or may be rechargeable. Typically, for housing the same laser light source **400**, receptacle **110** would project further forward from light body **120** than would tubular receptacle **110'** to avoid extending into the space provided for the battery.

Typically, receptacle **110** or **110'** would be integrally molded with light body **120**, and the electrical wires of laser light source **400** would extend upward within light body **120**, e.g., along a wall of the battery compartment therein, to connect to LED module assembly **170**.

FIG. **9**A is a front view of an alternative embodiment including mounting an example laser light source **400** on a flexible stalk **500** that is mounted to the example portable light **100**, and FIGS. **9**B and **9**C are a perspective view and a cross-sectional view, respectively, of the example laser light source **400** mounted on the flexible stalk **500**. Therein, laser light source **400** is mounted in a head housing **520** which is at the distal end of a flexible stalk **510** from the end thereof that is mounted to the housing or body **120** of portable light **100**. For example, the flexible stalk **510** may be mounted to housing **120** at either location **502**A, e.g., of attachment **512**A, or at location **502**B, e.g., of attachment **512**B as illustrated, or alternatively may be mounted to housing **120** at any convenient location.

Flexible stalk **500** may be permanently mounted to housing **120**, e.g., by a fastener or other mechanical retainer, or by adhesive, heat or ultrasonic welding, or may be mounted so as to be removable from housing **120**, e.g., as by an electrical connector. The mounting of stalk **510** to housing **120** preferably includes a surrounding member **512**A or **512**B similar to member **522** at the distal end of stalk **510** where housing **540** of head **520** is attached thereto. Preferably the mounting of stalk **500** includes one or more seals to reduce entry of dirt, debris and/or moisture into housing **120** and head **520**.

Flexible stalk **500** comprises a flexible stalk member **510** that at one end is mounted to light housing **120** and that has a head housing **520** at the other end thereof, e.g., the end distal from light housing **120**, that supports laser light source **400**. Flexible stalk **510** may be, e.g., a flexible tube of a helically wound metal or plastic strip and may have a thin plastic coating or sheath on the outer surface thereof. Stalk **510** has a hollow interior through which one or more electrical wires pass to connect laser light source **400** in light head **500** to the source of electrical power therefor which is disposed in housing **120**.

Head housing **520** includes an outer housing **540** that preferably is permanently mounted to flexible stalk **510**, e.g., as by being swaged thereto, molded thereon, or otherwise mechanically and/or adhesively attached, and housing **540** preferably has a tapered end portion surrounding the distal end of flexible stalk **510**, e.g., to provide strain relief when stalk **510** is flexed, bent or formed in use to direct the light from laser light source **400** in a desired direction.

While illumination light source **140** emits illumination light in a substantially fixed predetermined direction relative to the light body **120**, in all of the example embodiments the plane **450** of laser light is emitted in substantially the same predetermined direction relative to the light body **120**. This is so even though the direction in which the plane **450** of laser light may be changed by flexing stalk **510**. In other words, both the illumination light and the plane of laser light are emitted in the same general direction, and substantially the predetermined direction is intended to encompass such changes in direction of the laser light.

Forward end cap **550** that is of an optically transparent material so that the laser light produced by laser light source **400** passes therethrough, e.g., substantially in the direction of the longitudinal axis of light head **520**. According to one embodiment, end cap **550** is affixed to housing **540** and encloses the end cap **430** of laser light source **400** which supports the cylindrical lens **440**. In this embodiment, the direction and orientation of the plane **450** of laser light is changed by moving and rotating light head **520** to the extent permitted by the flexibility of stalk **510**.

According to another embodiment, end cap **550** also covers and encloses the forward end of laser light source **400**, however, end cap **430** that supports the cylindrical lens **440** is affixed to end cap **550** which is rotatable relative to housing **540** of light head **520**. Thus, rotating end cap **550** causes the cylindrical lens **440** supported by end cap **430** to be rotated. In this embodiment, the direction and orientation of the plane **450** of laser light is changed by moving and rotating light head **520** to the extent permitted by the flexibility of stalk **510**, and by rotating end cap **550** relative to housing **540**, thereby to permit more freedom in the orientation of the plane **450** of laser light. Preferably, a seal **552** is provided between end cap **550** and housing **540** to reduce entry of dirt, debris and/or moisture therein.

Optionally, housing **540** and/or end cap **550** may have one or more raised or recessed features, e.g., circumferential grooves and/or ridges, that may assist gripping light head **520** and/or may be aesthetic.

In one example embodiment, laser light source **400** may include a 650 nanometer (red) 5 milliwatt laser module that is available from Sean & Stephen Corporation located in Taipei, Taiwan, R.O.C. or from Laser Max located in Taipei, Taiwan, R.O.C. The lens support **430** may be about 12 mm in diameter, about 8 mm in length, and registration feature **434** may be a flat surface about 5.25 mm radially removed from the central axis of support **430**. Cylindrical lens **440** is a rod of glass or plastic, e.g., an acrylic PMMA or optical polycarbonate plastic, having a length of about 7.2 mm and a diameter of about 3.0 mm which provides a line or plane **450** of laser light typically having an angle A of about 1.5 degrees of out of plane dispersion and an angle B of about 120° of beam width. Flexible stalk **510** may be of any desired length, e.g., in one embodiment stalk **510** has a length of about 9 inches (about 23 cm), in another a length of about 3-5 inches (about 7.6-13 cm) and in a preferred embodiment stalk **510** has a length of about 1-3 inches (about 2.5-7.6 cm).

In a typical embodiment, TIR optical element **200** and lens **142** may be of an optically clear material, e.g., a glass, polycarbonate, polystyrene, PMMA (acrylic), acrylic, styrene acryl nitride (SAN), or another suitable clear plastic, glass or other suitable optical material. One example embodiment of optical element **200** is about 1.97 inches (about 50 mm) in diameter at its wide flat end, about 0.68 inch (about 17.3 mm) in diameter at its narrower end, and about 1.0 inch (about 25.4 mm) in depth front to rear. Forward cylindrical recess **250** thereof is about 0.70 inch (about 17.8 mm) in diameter and about 0.24 inch (about 6.1 mm) in depth, and rear recess **260** is about 0.67 inch (about 17 mm) in diameter and about 0.46 inch (about 11.7 mm) in depth. An example selectable beam modification element **300** therefor may be of acrylic, styrene or another suitable plastic, and is slightly less than about 0.67 inch (about 17 mm) in diameter and about 0.11 inch (about 2.8 mm) thick.

Another example embodiment of beam modification element **200** is about 1.97 inches (about 50 mm) in diameter at its wide flat end, about 0.65 inch (about 16.5 mm) in diameter at its narrower end, and about 1.0 inch (about 25.4 mm) in depth front to rear. Forward cylindrical recess **250** thereof is about 0.45 inch (about 11.4 mm) in diameter and about 0.3 inch (about 7.6 mm) in depth, and rear recess **260** is about 0.59 inch (about 15 mm) in diameter and about 0.50 inch (about 12.7 mm) in depth. An example selectable beam modification element **300** therefor may be of acrylic, styrene or another suitable plastic, and is slightly less than about 0.45 inch (about 11.4 mm) in diameter and about 0.11 inch (about 2.8 mm) thick.

In the aforementioned examples of optical element **200**, side surface **240** has a shape that is a series of arches and curved bottom **270** has a domed or peaked shape as illustrated, one example being rounded and convex, almost parabolic and not quite spherical, and the other example being a curved sided peaked conical dome with concave side curvature.

One example of an LED module and heat sink of the sort suitable for use in light **100** and similar to that described herein is described in U.S. Pat. No. 7,883,243 issued Feb. 8, 2011 and entitled “LED FLASHLIGHT AND HEAT SINK ARRANGEMENT” which is assigned to Streamlight, Inc. of Eagleville, Pa., which is hereby incorporated herein by reference in its entirety.

A portable light **100** may comprise: a light body **120** for receiving a source of electrical power; a white light source **140** supported by the light body **120** and selectively energizable for producing white light; a laser light source **400** supported by the light body **120** and selectively energizable for producing laser light, wherein the laser light source **400** may include a cylindrical lens **440** configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light **450**, whereby the laser light source **400** is configured to emit a plane of laser light **450**; and a switch **160** supported by the light body **120** for selectively energizing the white light source **140** from the source of electrical power, and for selectively energizing the laser light source **400** from the source of electrical power. The laser emission element may comprise a laser diode. The laser light source **400** may include a registration feature on an external surface thereof disposed in registration with a longitudinal axis of the cylindrical lens **440**. The registration feature may have an axis oriented perpendicular to the longitudinal axis of the cylindrical lens **440**. The white light source **140** may include a shaped optically clear plastic element having a polished curved external side surface and a generally wider flat forward surface oriented such that the white light exits the white light source **140** through the flat forward surface, and wherein the laser light source **400** is supported by the flat forward surface. The switch **160** may be operable so that only one of the white light source **140** and the laser light source **400** is active at a given time. The white light source **140** and the laser light source **400** may emit light in substantially the same direction. The laser light source **400** may be configured: for rotating the plane of laser light **450** relative to the light body **120**; or for repositioning the plane of laser light **450** relative to the light body **120**. The laser light source **400** may be supported by a shaped optical element **200** of the white light source **140** or may be supported by a receptacle of the light body **120** or may be supported at a distal end of a flexible stalk **500**, **510** supported by the light body **120**. The laser light source **400** may be configured: for rotating the plane of laser light **450** relative to the light body **120**; or for repositioning the plane of laser light **450** relative to the light body **120**.

A portable light **100** may comprise: a light body **120** for receiving a source of electrical power; an illumination light source **140** supported by the light body **120** and selectively energizable for producing illumination light; a laser light source **400** supported by the light body **120** and selectively energizable for producing laser light, wherein the laser light source **400** may include a cylindrical lens **440** configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light **450**, whereby the laser light source **400** is configured to emit a plane of laser light **450**; and a switch **160** supported by the light body **120** for selectively energizing the illumination light source **140** from the source of electrical power and for selectively energizing the laser light source **400** from the source of electrical power. The laser emission element may comprise a laser diode. The laser light source **400** may include a registration feature on an external surface thereof disposed in registration with a longitudinal axis of the cylindrical lens **440**. The registration feature may have an axis oriented perpendicular to the longitudinal axis of the cylindrical lens **440**. The illumination light source **140** may include a shaped optically clear element **200** having a polished curved external side surface and a generally wider flat forward surface whereat the illumination light exits the illumination light source **140** through the flat forward surface, and wherein the laser light source **400** is supported by the shaped optically clear element **200**. The switch **160** may be operable so that only one of the illumination light source **140** and laser light source **400** is energized at a given time. The illumination light source **140** and the laser light source **400** may emit light in substantially the same direction. The laser light source **400** may be configured: for rotating the plane of laser light **450** relative to the light body **120**; or for repositioning the plane of laser light **450** relative to the light body **120**. The laser light source **400** may be supported by a shaped optical element **200** of the illumination light source **140** or may be supported by a receptacle of the light body **120** or may be supported at a distal end of a flexible stalk **500**, **510** supported by the light body **120**. The laser light source **400** may be configured: for rotating the plane of laser light **450** relative to the light body **120**; or for repositioning the plane of laser light **450** relative to the light body **120**. The laser light source **400**: may be supported by a reflective element of the illumination light source **140** and may be rotatable relative thereto; or may be supported by a receptacle of the light body **120** and may be rotatable relative thereto; or may be supported on a flexible stalk **500**, **510** that is attached to the light body **120**. The laser light source **400** may further include a support for the cylindrical lens **440**, wherein: the support for the cylindrical lens **440** is rotatable relative to the light body **120**, whereby a longitudinal axis of the cylindrical lens **440** is rotatable relative to the light body **120**; or the laser emission element and the support for the cylindrical lens **440** are supported on a flexible stalk **500**, **510** that is attached to the light body **120**, whereby a longitudinal axis of the cylindrical lens **440** is repositionable relative to the light body **120**; or the laser emission element and the support for the cylindrical lens **440** are supported on a flexible stalk **500**, **510** that is attached to the light body **120** and the support for the cylindrical lens **440** is rotatable relative to the flexible stalk **500**, **510**, whereby a longitudinal axis of the cylindrical lens **440** is rotatable and repositionable relative to the light body **120**.

A portable light **100** may comprise: a light body **120** for receiving a source of electrical power and having a base end; an illumination light source **140** supported by the light body **120** relatively nearer to an end thereof that is remote to the base end thereof, the illumination light source **140** being configured to emit illumination light in a predetermined direction relative to the light body **120** and being selectively energizable for producing illumination light; a laser light source **400** supported by the light body **120** relatively nearer to the base end thereof than is the illumination light source and being selectively energizable for producing laser light, wherein the laser light source **400** includes a cylindrical lens **440** configured for receiving laser light from a laser emission element and for transmitting the received laser light as a plane **450** of laser light in substantially the predetermined direction relative to the light body **120**, whereby the laser light source **440** is configured to emit a plane **450** of laser light in the same general direction as the illumination light is emitted; and a switch **160** supported by the light body **120** for selectively energizing the illumination light source **140** from the source of electrical power and for selectively energizing the laser light source **400** from the source of electrical power. The laser light source **400** may be: supported in a fixed location that is relatively nearer to the base end of the light body **120** than is the illumination light source **140**; or supported on a flexible stalk **510** that is relatively nearer to the base end **130** of the light body **120** than is the illumination light source **140**. The laser light source **400** may further include a support for the cylindrical lens **440**, wherein: the support for the cylindrical lens **440** is rotatable relative to the light body **120**, whereby a longitudinal axis of the cylindrical lens **440** is rotatable relative to the light body **120**; or the laser emission element and the support for the cylindrical lens **440** are supported on a flexible stalk **500**, **510** that is attached to the light body **120**, whereby a longitudinal axis of the cylindrical lens **440** is repositionable relative to the light body **120**; or the laser emission element and the support for the cylindrical lens **440** are supported on a flexible stalk **500**, **510** that is attached to the light body **120** and the support for the cylindrical lens **440** is rotatable relative to the flexible stalk **500**, **510**, whereby a longitudinal axis of the cylindrical lens **440** is rotatable and repositionable relative to the light body **120**. The switch **160** is operable so that only one of the illumination light source **140** and laser light source **400** is energized at a given time.

A portable light **100** may comprise: a light body **120** for receiving a source of electrical power; an illumination light source **140** supported by the light body **120** and selectively energizable for producing illumination light, wherein the illumination light source **140** includes a shaped optically clear element **200** having a polished curved external side surface and a flat forward surface through which the illumination light exits the illumination light source **140** in a predetermined direction relative to the light body **120**; a laser light source **400** supported by the shaped optically clear element **200** and selectively energizable for producing laser light, wherein the laser light source **400** includes a cylindrical lens **440** configured for receiving light from a laser emission element and for transmitting the received light as a plane **450** of laser light; and a switch **160** supported by the light body **120** for selectively energizing the illumination light source **140** from the source of electrical power and for selectively energizing the laser light source **400** from the source of electrical power. The plane **450** of laser light may be emitted substantially in the predetermined direction relative to the light body **120**, whereby the laser light source **400** is configured to emit a plane **450** of laser light in the same general direction as the illumination light is emitted. The laser light source **400** may further include a support **430** for the cylindrical lens **440** that is rotatable relative to the light body **120**, whereby a longitudinal axis of the cylindrical lens **440** and the plane **450** of laser light transmitted thereby are rotatable relative to the light body **120**. The switch **160** may be operable so that only one of the illumination light source **140** and the laser light source **400** is energized at a given time.

A portable light **100** may comprise: a light body **120** for receiving a source of electrical power; an illumination, e.g., white, light source **140**, **176** supported by the light body **120** and selectively energizable for producing light; a laser light source **400** supported by said light body **120** and selectively energizable for producing laser light, the laser light source configured to emit a plane of laser light **450**; a switch **160**, **172** supported by the light body **120** for selectively energizing the white light source **140**, **176** from the source of electrical power; a TIR optical element **200** having a rearward end disposed in front of the white light source **140**, **176** for receiving the light produced thereby, the TIR optical element **200** employing total internal reflection to form light produced by the white light source **140**, **176** into a collimated beam of light, the TIR optical element **200** having a recess **250** in a forward face thereof; a selectable beam modification element **300** having a size and shape corresponding to the recess **250** in the forward face of the TIR optical element **200**, wherein the selectable beam modification element **300** is placeable into the recess **250** in the forward face of the TIR optical element **200** and is removable from the recess **250** in the forward face of the TIR optical element **200**; and means for removably retaining the selectable beam modification element **300** in the recess **250** in the forward face of the TIR optical element **200**. The means for removably retaining may include: friction between the selectable beam modification element **300** and the recess **250**, pressure urging the selectable beam modification element **300** into the recess **250**, a cover, a lens, a lens and ring, a press in cover, a snap in cover, the selectable beam modification element **300** having a resilient periphery, the selectable beam modification element **300** being of a resilient material, the selectable beam modification element **300** having a diameter to contact the inner surface of the recess **250** in the TIR optical element **200**, the selectable beam modification element **300** having an O-ring in a peripheral groove, or a combination thereof. The selectable beam modification element **300** may be opaque, or transparent, or translucent, or a color, or a combination thereof. The TIR optical element **200** may comprise: a shaped optically clear plastic element **210** having a polished curved external side surface **240**, a generally wider flat forward surface **220**, and a narrower rearward shaped surface **230**, **260**, **270**. The TIR optical element **200** may have: a substantially cylindrical recess **260** at the rearward shaped surface thereof, the substantially cylindrical recess **260** having a curved convex bottom or a peaked conical bottom having concave sides for reflecting light through a side wall of the cylindrical recess **260**; or a cylindrical recess **250** in the flat forward face thereof having a textured surface at the bottom thereof; or a substantially cylindrical recess **260** at the rearward shaped surface thereof, the substantially cylindrical recess **260** having a curved convex bottom or a peaked conical bottom having concave sides for reflecting light through a side wall of the cylindrical recess **260**, and a cylindrical recess **250** in the flat forward face thereof having a textured surface at the bottom thereof. The portable light **100** wherein: the curved external side surface of the TIR optical element **200** is substantially parabolic; or the narrower rearward surface of the TIR optical element **200** includes a convex parabolic surface; or the curved external side surface of the TIR optical element **200** is substantially parabolic and the narrower rearward surface of the TIR optical element **200** includes a convex parabolic surface or a peaked conical surface having concave sides. The selectable beam modification element **300** includes a plurality of selectable beam modification elements **300**, at least one of the plurality of selectable beam modification elements **300** being opaque and at least one of the plurality of selectable beam modification elements **300** being transparent or translucent and being colored. The selectable beam modification element **300** includes a set of a plurality of selectable beam modification elements **300**, each of the selectable beam modification elements **300** having an optical property that is different from an optical property of another of the selectable beam modification elements **300**.

A portable light **100** may comprise: a light body **120**; a white light source **140**, **176** selectively energizable for producing light; a laser light source **400** supported by said light body **120** and selectively energizable for producing laser light, the laser light source configured to emit a plane of laser light **450**; a switch **160**, **172** for selectively energizing the white light source **140**, **176**; a TIR optical element **200** disposed in front of the white light source **140**, **176** for receiving the light produced thereby, and to form the light produced thereby into a collimated beam of light, the TIR optical element having a recess **250** in a forward face thereof; and a selectable beam modification element **300** placeable into and removable from the recess **250** in the forward face of the TIR optical element. The means for removably retaining may include: friction between the selectable beam modification element **300** and the recess **250**, pressure urging the selectable beam modification element **300** into the recess **250**, a cover, a lens, a lens and ring, a press in cover, a snap in cover, the selectable beam modification element **300** having a resilient periphery, the selectable beam modification element **300** being of a resilient material, the selectable beam modification element **300** having a diameter to contact the inner surface of the recess **250** in the TIR optical element **200**, the selectable beam modification element **300** having an O-ring in a peripheral groove, or a combination thereof. The selectable beam modification element **300** may be opaque, or transparent, or translucent, or a color, or a combination thereof. The TIR optical element **200** may comprise: a shaped optically clear plastic element **210** having a polished curved external side surface **240**, a generally wider flat forward surface **220**, and a narrower rearward shaped surface **230**, **260**, **270**. The TIR optical element **200** may have: a substantially cylindrical recess **260** at the rearward shaped surface thereof, the substantially cylindrical recess **260** having a curved convex bottom or a peaked conical bottom having concave sides for reflecting light through a side wall of the cylindrical recess **260**; or a cylindrical recess **250** in the flat forward face thereof having a textured surface at the bottom thereof; or a substantially cylindrical recess **260** at the rearward shaped surface thereof, the substantially cylindrical recess **260** having a curved convex bottom or a peaked conical bottom having concave sides for reflecting light through a side wall of the cylindrical recess **260**, and a cylindrical recess **250** in the flat forward face thereof having a textured surface at the bottom thereof. The portable light **100** wherein: the curved external side surface of the TIR optical element **200** is substantially parabolic; or the narrower rearward surface of the TIR optical element **200** includes a convex parabolic surface; or the curved external side surface of the TIR optical element **200** is substantially parabolic and the narrower rearward surface of the TIR optical element **200** includes a convex parabolic surface or a peaked conical surface having concave sides. The selectable beam modification element **300** includes a plurality of selectable beam modification elements **300**, at least one of the plurality of selectable beam modification elements **300** being opaque and at least one of the plurality of selectable beam modification elements **300** being transparent or translucent and being colored. The selectable beam modification element **300** includes a set of a plurality of selectable beam modification elements **300**, each of the selectable beam modification elements **300** having an optical property that is different from an optical property of another of the selectable beam modification elements **300**.

As used herein, the term "about" means that dimensions, sizes, formulations, parameters, shapes and other quantities and characteristics are not and need not be exact, but may be approximate and/or larger or smaller, as desired, reflecting tolerances, conversion factors, rounding off, measurement error and the like, and other factors known to those of skill in the art. In general, a dimension, size, formulation, parameter, shape or other quantity or characteristic is "about" or "approximate" whether or not expressly stated to be such. It is noted that embodiments of very different sizes, shapes and dimensions may employ the described arrangements.

Although terms such as "up," "down," "left," "right," "up," "down," "front," "rear," "side," "end," "top," "bottom," "forward," "backward," "under" and/or "over," "vertical," "horizontal," and the like may be used herein as a convenience in describing one or more embodiments and/or uses of the present arrangement, the articles described may be positioned in any desired orientation and/or may be utilized in any desired position and/or orientation. Such terms of position and/or orientation should be understood as being for convenience only, and not as limiting of the invention as claimed.

As used herein, the term "and/or" encompasses both the conjunctive and the disjunctive cases, so that a phrase in the form "A and/or B" encompasses "A" or "B" or "A and B." In addition, the term "at least one of" one or more elements is intended to include one of any one of the elements, more than one of any of the elements, and two or more of the elements up to and including all of the elements, and so, e.g., the phrase in the form "at least one of A, B and C" includes "A," "B," "C," "A and B," "A and C," "B and C," and "A and B and C."

The term battery is used herein to refer to an electro-chemical device comprising one or more electro-chemical cells and/or fuel cells, and so a battery may include a single cell or plural cells, whether as individual units or as a packaged unit. A battery is one example of a type of an electrical power source suitable for a portable device. Other devices could include fuel cells, super capacitors, solar cells, and the like. Any of the foregoing may be intended for a single use or for being rechargeable or for both

Various embodiments of a battery may have one or more battery cells, e.g., one, two, three, four, or five or more battery cells, as may be deemed suitable for any particular device. A battery may employ various types and kinds of battery chemistry types, e.g., a carbon-zinc, alkaline, lead acid, nickel-cadmium (Ni—Cd), nickel-metal-hydride (NIMH) or lithium-ion (Li-Ion) battery type, of a suitable number of cells and cell capacity for providing a desired operating time and/or lifetime for a particular device, and may be intended for a single use or for being rechargeable or for both. Examples may include a four cell lead acid battery typically producing about 6 volts, volts, a four cell Ni—Cd battery typically producing about 6 volts, a four cell NiMH battery typically producing about 4.8 volts, a four cell NiMH battery producing about 6 volts, or a Li-Ion battery typically producing about the same voltage, it being noted that the voltages produced thereby will be higher when approaching full charge and will be lower in discharge, particularly when providing higher current and when reaching a low level of charge, e.g., becoming discharged.

The term DC converter is used herein to refer to any electronic circuit that receives at an input electrical power at one voltage and current level and provides at an output DC electrical power at a different voltage and/or current level. Examples may include a DC-DC converter, an AC-DC converter, a boost converter, a buck converter, a buck-boost converter, a single-ended primary-inductor converter (SEPIC), a series regulating element, a current level regulator, and the like. The input and output thereof may be DC coupled and/or AC coupled, e.g., as by a transformer and/or capacitor. A DC converter may or may not include circuitry for regulating a voltage and/or a current level, e.g., at an output thereof, and may have one or more outputs providing electrical power at different voltage and/or current levels and/or in different forms, e.g., AC or DC.

A fastener as used herein may include any fastener or other fastening device that may be suitable for the described use, including threaded fasteners, e.g., bolts, screws and driven fasteners, as well as pins, rivets, nails, spikes, barbed fasteners, clips, clamps, nuts, speed nuts, cap nuts, acorn nuts, and the like. Where it is apparent that a fastener would be removable in the usual use of the example embodiment described herein, then removable fasteners would be preferred in such instances. A fastener may also include, where appropriate, other forms of fastening such as a formed head, e.g., a peened or heat formed head, a weld, e.g., a heat weld or ultrasonic weld, a braze, and adhesive, and the like.

As used herein, the terms "connected" and "coupled" as well as variations thereof are not intended to be exact synonyms, but to encompass some similar things and some different things. The term "connected" may be used generally to refer to elements that have a direct electrical and/or physical contact to each other, whereas the term "coupled" may be used generally to refer to elements that have an indirect electrical and/or physical contact with each other, e.g., via one or more intermediate elements, so as to cooperate and/or interact with each other, and may include elements in direct contact as well.

While the present invention has been described in terms of the foregoing example embodiments, variations within the scope and spirit of the present invention as defined by the claims following will be apparent to those skilled in the art. For example, the laser light source **400** may be configured so that the plane of laser light **450** is substantially parallel to the central axis of the optical element **200** or may be configured so that the plane of laser light **450** diverges from the central axis of the optical element **200** (and from the beam of illumination light, e.g., white light, provided thereby).

The laser light source **400** and/or the cylindrical lens **440** thereof may be configured to be in a predetermined fixed relationship relative to light **100** and optical element **200** thereof, or may be configured to be rotatable with respect to light **100**, whereby the orientation of the plane of laser light **450** rotatable. Rotating the plane of laser light **450** relative to light **100** may be provided by optical element **200** being rotatable in light **100**, by laser light source **400** being rotatable in optical element **200**, or by the longitudinal axis of cylindrical lens **440** being rotatable relative to light **100**, or by a combination thereof. In any of the foregoing arrangements, rotation of the one or more elements my be provided by an actuator accessible from outside light **100**, e.g., by a rotatable ring, by a lever, by a slidable actuator and the like.

Further, and alternatively, laser light source **400** may be supported in the central region of optical element **200**, e.g., within recess **250** thereof. In such alternative arrangement, beam modification element **300** could have a central hole therein so as to be inserted into recess **250** to surround laser light source **400**, or could be a permanently installed part of optical element **200**, e.g., as a opaque or translucent annular washer in recess **250** thereof. In this alternative arrangement, when laser light source **400** is configured such that the plane **450** of laser light is rotatable, the opening in lens **144** through which laser light source **400** extends would be centrally located which would ease the mounting and removal of lens ring **142** and lens **144**, e.g., when installing or removing beam modification element **300**.

While a red emitting laser light source **400** is described in an example embodiment, the light produced by the laser light source **400** may be at another wavelength, e.g., at a wavelength of red, or blue, or green, or amber, light. Further, the color of the laser light may be changeable from one color to another, either by replacing a laser light source **400** with a laser light source of another color light, or by providing one or more laser light sources **400** that can be electronically controlled to produce laser light of different colors, e.g., at different wavelengths.

Actuator **160** may be configured to actuate illumination light source **140** and laser light source **400** together, e.g., toggling between both on and both off, or independently, e.g., in a sequential order such as white light, laser light, and white and laser light together, or by being responsive to how actuator **160** is actuated, e.g., by a single actuation, by plural actuations close in time, by an actuation continuing for an extended time, and the like. Alternatively, actuator **160** may include physically separate actuators, e.g., one for illumination light source **140** and another for laser light source **400**.

Alternatively, a separate actuator and switch may be provided for laser light source **400**, e.g., proximate to or on receptacle **110**, **110'** therefor and/or proximate to or on head **520** at the end of flexible stalk **510**. Flexible stalk **510** may be made relatively short, e.g., about 1-2 inches (about 2.5-5 cm), which is sufficient to provide limited user adjustable directionality to the plane of laser light, or it may be relatively longer, e.g., about 8-10 inches (about 20-25 cm), where greater user adjustability is desired, or any intermediate length.

In optical element **200**, side surface **240** may have a parabolic, hyperbolic or spherical shape and curved bottom **270** may have the same or a different parabolic, hyperbolic or spherical shape, or surfaces **240**, **270** may have another suitable shape.

Hanger or loop **155** may alternatively be rendered pivotable by the ends thereof being disposed in holes in clip **150** or in housing **120**, or by the ends or a portion thereof being directly and pivotably attached to housing **120**, e.g., by bracket **152**.

While certain features may be described as a raised feature, e.g., a ridge, boss, flange, projection or other raised feature, such feature may be positively formed or may be what remains after a recessed feature, e.g., a groove, slot, hole, indentation, recess or other recessed feature, is made. Similarly, while certain features may be described as a recessed feature, e.g., a groove, slot, hole, indentation, recess or other recessed feature, such feature may be positively formed or may be what remains after a raised feature, e.g., a ridge, boss, flange, projection or other raised feature, is made.

Each of the U.S. Provisional applications, U.S. patent applications, and/or U.S. patents, identified herein is hereby incorporated herein by reference in its entirety, for any purpose and for all purposes irrespective of how it may be referred to or described herein.

Finally, numerical values stated are typical or example values, are not limiting values, and do not preclude substantially larger and/or substantially smaller values. Values in any given embodiment may be substantially larger and/or may be substantially smaller than the example or typical values stated.

What is claimed is:

1. A portable light comprising:

a light body for receiving a source of electrical power;

a white light source supported by said light body and selectively energizable for producing white light;

a laser light source supported by said light body and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light, the cylindrical lens receiving laser light at a first part of a cylindrical surface thereof and emitting the plane of laser light from a second part of that cylindrical surface, whereby the laser light source is configured to emit a plane of laser light; and

a switch supported by said light body for selectively energizing said white light source from the source of electrical power, and for selectively energizing said laser light source from the source of electrical power.

2. The portable light of claim **1** wherein the laser emission element comprises a laser diode.

3. The portable light of claim **1** wherein said laser light source includes a registration feature on an external surface thereof disposed in registration with a longitudinal axis of the cylindrical lens.

4. The portable light of claim **3** wherein the registration feature has an axis oriented perpendicular to the longitudinal axis of the cylindrical lens.

5. The portable light of claim **1** wherein said switch is operable so that only one of said white light source and said laser light source is active at a given time.

6. The portable light of claim **1** wherein said white light source and said laser light source emit light in substantially the same direction.

7. The portable light of claim **1** wherein said laser light source is configured:

for rotating the plane of laser light relative to said light body; or

for repositioning the plane of laser light relative to said light body.

8. The portable light of claim **1** wherein said laser light source is supported by a shaped optical element of said white light source or is supported by a receptacle of said light body or is supported at a distal end of a flexible stalk supported by said light body.

9. The portable light of claim **8** wherein said laser light source is configured:

for rotating the plane of laser light relative to said light body; or

for repositioning the plane of laser light relative to said light body.

10. A portable light comprising:

a light body for receiving a source of electrical power;

a white light source supported by said light body and selectively energizable for producing white light;

a laser light source supported by said light body and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light, whereby the laser light source is configured to emit a plane of laser light; and

a switch supported by said light body for selectively energizing said white light source from the source of electrical power, and for selectively energizing said laser light source from the source of electrical power; and

wherein said white light source includes a shaped optically clear plastic element having a polished curved external side surface and a generally wider flat forward surface oriented such that the white light exits the white light source through the flat forward surface, and wherein the laser light source is supported by the flat forward surface.

11. A portable light comprising:

a light body for receiving a source of electrical power;

an illumination light source supported by said light body and selectively energizable for producing illumination light;

a laser light source supported by said light body and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light, the cylindrical lens receiving laser light at a first part of a cylindrical surface thereof and emitting the plane of laser light from a second part of that cylindrical surface, whereby the laser light source is configured to emit a plane of laser light; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power.

12. The portable light of claim **11** wherein the laser emission element comprises a laser diode.

13. The portable light of claim **11** wherein said laser light source includes a registration feature on an external surface thereof disposed in registration with a longitudinal axis of the cylindrical lens.

14. The portable light of claim **13** wherein the registration feature has an axis oriented perpendicular to the longitudinal axis of the cylindrical lens.

15. The portable light of claim **11** wherein said switch is operable so that only one of the illumination light source and laser light source is energized at a given time.

16. The portable light of claim **11** wherein said illumination light source and said laser light source emit light in substantially the same direction.

17. The portable light of claim **11** wherein said laser light source is configured:

for rotating the plane of laser light relative to said light body; or

for repositioning the plane of laser light relative to said light body.

18. The portable light of claim **11** wherein said laser light source is supported by a shaped optical element of said illumination light source or is supported by a receptacle of said light body or is supported at a distal end of a flexible stalk supported by said light body.

19. The portable light of claim **18** wherein said laser light source is configured:

for rotating the plane of laser light relative to said light body; or

for repositioning the plane of laser light relative to said light body.

20. The portable light of claim **19** wherein said laser light source:

is supported by a reflective element of said illumination light source and is rotatable relative thereto; or

is supported by a receptacle of said light body and is rotatable relative thereto; or

is supported on a flexible stalk that is attached to said light body.

21. The portable light of claim **11** wherein said laser light source further includes a support for said cylindrical lens, wherein:

the support for said cylindrical lens is rotatable relative to said light body, whereby a longitudinal axis of said cylindrical lens is rotatable relative to said light body; or

the laser emission element and the support for said cylindrical lens are supported on a flexible stalk that is attached to said light body, whereby a longitudinal axis of said cylindrical lens is repositionable relative to said light body; or the laser emission element and the support for said cylindrical lens are supported on a flexible stalk that is attached to said light body and said support for said cylindrical lens is rotatable relative to said flexible stalk, whereby a longitudinal axis of said cylindrical lens is rotatable and repositionable relative to said light body.

22. A portable light comprising:

a light body for receiving a source of electrical power;

an illumination light source supported by said light body and selectively energizable for producing illumination light;

a laser light source supported by said light body and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light, whereby the laser light source is configured to emit a plane of laser light; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power; and

wherein said illumination light source includes a shaped optically clear element having a polished curved external side surface and a generally wider flat forward surface whereat the illumination light exits said illumination light source through the flat forward surface, and wherein said laser light source is supported by said shaped optically clear element.

23. A portable light comprising:

a light body for receiving a source of electrical power and having a base end;

an illumination light source supported by said light body relatively nearer to an end thereof that is remote to the base end thereof, said illumination light source being configured to emit illumination light in a predetermined direction relative to said light body and being selectively energizable for producing illumination light;

a laser light source supported by said light body relatively nearer to the base end thereof than is said illumination light source and being selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving laser light from a laser emission element and for transmitting the received laser light as a plane of laser light in substantially the predetermined direction relative to said light body, the cylindrical lens receiving laser light at a first part of a cylindrical surface thereof and emitting the plane of laser light from a second part of that cylindrical surface, whereby the laser light source is configured to emit a plane of laser light in the same general direction as the illumination light is emitted; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power.

24. The portable light of claim **23** wherein said laser light source is:

supported in a fixed location that is relatively nearer to the base end of said light body than is said illumination light source; or

supported on a flexible stalk that is relatively nearer to the base end of said light body than is said illumination light source.

25. The portable light of claim **23** wherein said switch is operable so that only one of the illumination light source and laser light source is energized at a given time.

26. A portable light comprising:

a light body for receiving a source of electrical power and having a base end;

an illumination light source supported by said light body relatively nearer to an end thereof that is remote to the base end thereof, said illumination light source being configured to emit illumination light in a predetermined direction relative to said light body and being selectively energizable for producing illumination light;

a laser light source supported by said light body relatively nearer to the base end thereof than is said illumination light source and being selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving laser light from a laser emission element and for transmitting the received laser light as a plane of laser light in substantially the predetermined direction relative to said light body, whereby the laser light source is configured to emit a plane of laser light in the same general direction as the illumination light is emitted; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power; and

wherein said laser light source further includes a support for said cylindrical lens, wherein:

the support for said cylindrical lens is rotatable relative to said light body, whereby a longitudinal axis of said cylindrical lens is rotatable relative to said light body; or

the laser emission element and the support for said cylindrical lens are supported on a flexible stalk that is attached to said light body, whereby a longitudinal axis of said cylindrical lens is repositionable relative to said light body; or

the laser emission element and the support for said cylindrical lens are supported on a flexible stalk that is attached to said light body and said support for said cylindrical lens is rotatable relative to said flexible stalk, whereby a longitudinal axis of said cylindrical lens is rotatable and repositionable relative to said light body.

27. A portable light comprising:

a light body for receiving a source of electrical power;

an illumination light source supported by said light body and selectively energizable for producing illumination light, wherein said illumination light source includes a shaped optically clear element having a polished curved external side surface and a flat forward surface through which the illumination light exits said illumination light source in a predetermined direction relative to said light body;

a laser light source supported by said shaped optically clear element and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power.

28. The portable light of claim **27** wherein the plane of laser light is emitted substantially in the predetermined direction relative to said light body, whereby the laser light source is configured to emit a plane of laser light in the same general direction as the illumination light is emitted.

29. The portable light of claim **27** wherein said laser light source further includes a support for said cylindrical lens that is rotatable relative to said light body, whereby a longitudinal axis of said cylindrical lens and the plane of laser light transmitted thereby are rotatable relative to said light body.

30. The portable light of claim **27** wherein said switch is operable so that only one of said illumination light source and said laser light source is energized at a given time.

31. A portable light comprising:

a light body for receiving a source of electrical power;

an illumination light source supported by said light body and selectively energizable for producing illumination light, wherein said illumination light source includes a shaped optically clear element having a curved external side surface and a forward surface through which the illumination light exits said illumination light source in a predetermined direction relative to said light body;

a laser light source supported by said shaped optically clear element and selectively energizable for producing laser light, wherein said laser light source includes a cylindrical lens configured for receiving light from a laser emission element and for transmitting the received light as a plane of laser light; and

a switch supported by said light body for selectively energizing said illumination light source from the source of electrical power and for selectively energizing said laser light source from the source of electrical power.

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