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ILLUMINATED SAFETY HELMET

Filed Nov. 22, 1965

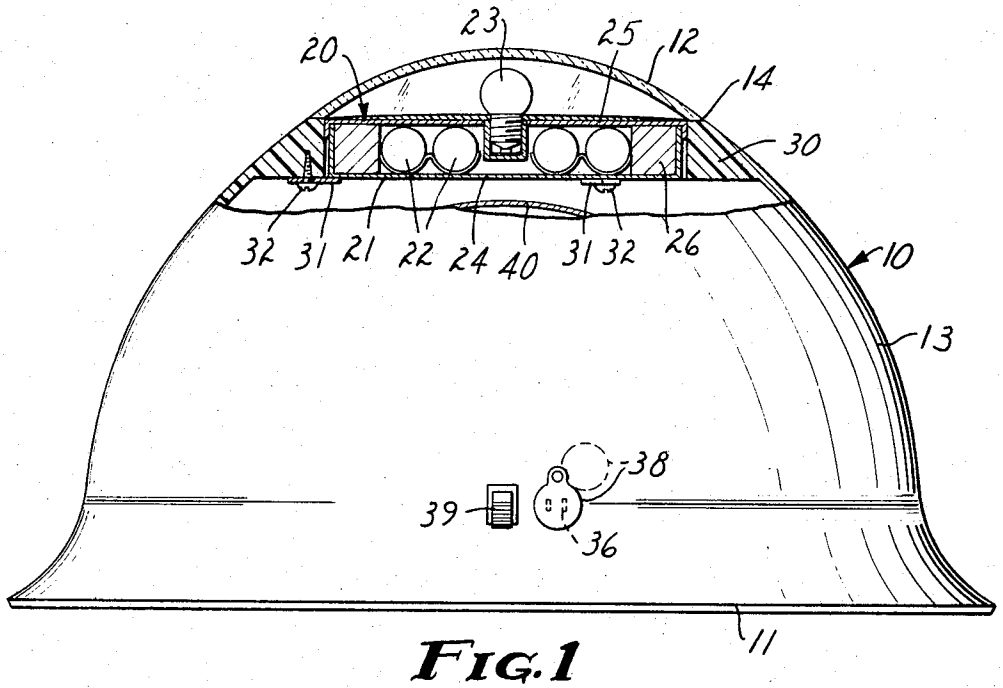


FIG. 1

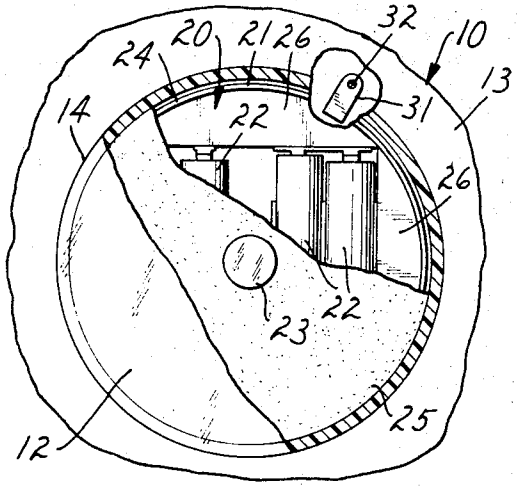


FIG. 3

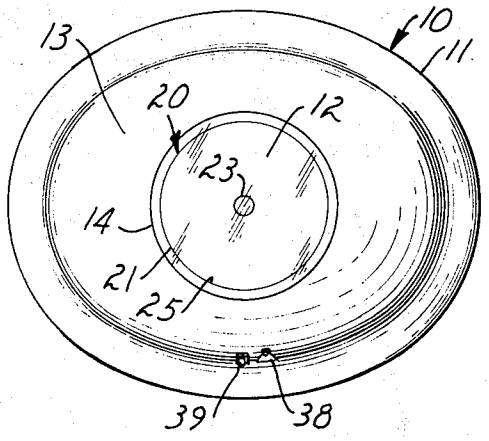


FIG. 2

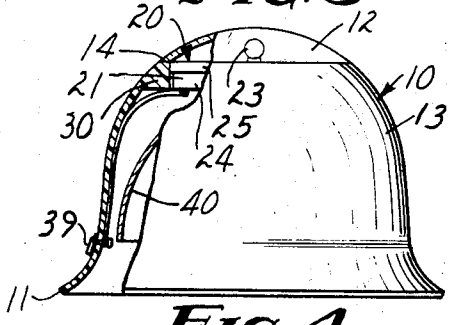


FIG. 4

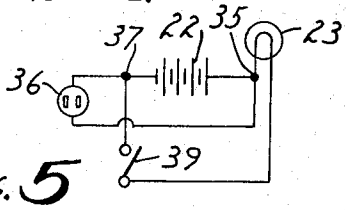


FIG. 5

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ILLUMINATED SAFETY HELMET

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ABSTRACT OF THE DISCLOSURE

A safety helmet for industrial use and the like having a light conducting portion adjacent the upper extremity extending 360° about the periphery and a light source with rechargeable batteries mounted so that light is transmitted directly through said light conducting portion of the helmet in an approximately 360° arc about the helmet. The helmet is constructed so that the outer surface forms a substantially continuous contour from one edge to the other to prevent obstructions from striking a direct blow on the helmet.

The present invention pertains to an illuminated safety helmet and more particularly to a helmet having an illuminated portion with a light source and energizing unit completely contained within the helmet and the illuminated portion blending with the remainder of the helmet to main the safety features and the structural strength thereof.

Many types of warning devices have been adapted for use with hats or the like in prior art but all of these devices are mounted on the outer surface of the hat and form a broken or irregular contour. Because of this irregular contour these hats are not useful as safety helmets since moving objects have a tendency to catch thereon and the full force of a blow is directed toward the hat. Also, in prior art devices the energizing means for the light sources are mounted exteriorly of the hat and require wires or the like to transmit the power to the light source. These wires are a great handicap to a person who is wearing the hat and attempting to do some work. Also, there is much inconvenience to removing the hat and the energization source when the wearer wishes to do so.

In the present invention a helmet is disclosed which is constructed of a rigid material and has a smooth and continuous contour from the edges thereof. The upper portion of the helmet is constructed of a light conducting material which has a high impact strength. Because the helmet has a smooth continuous contour the helmet reacts to moving objects and other blows in a fashion desirable for safety helmets by causing such objects and blows to glance off the smooth surface and, therefore, produce very little shock to the wearer.

A light source and energizing means are completely contained within the helmet and, therefore, there are no external wires or the like to inconvenience the wearer. The light source is generally of the type which provides a blinking action to draw immediate attention to the wearer. Also, the energizing means may be rechargeable batteries or the like with connecting means on the helmet to provide for recharging of the batteries without dismantling the helmet. Since this helmet may be utilized in a number of different situations, such as policemen directing traffic, school children directing traffic, highway workers, etc., it is desirable to have various colors of illumination, such as yellow, amber, red, etc. In the present invention either the light conducting material at the upper portion of the helmet or the light source itself may be tinted to provide any desirable color of illumination.

It is an object of the present invention to provide a new and improved illuminated safety helmet.

It is a further object of the present invention to provide an illuminated safety helmet having a smooth and continuous contour.

It is a further object of the present invention to provide an illuminated safety helmet having the light source and energizing means completely contained within the helmet.

It is a further object of the present invention to provide an illuminated safety helmet having rechargeable energizing means for the light source whereby the energizing means can be recharged without dismantling the helmet.

These and other objects of this invention will become apparent to those skilled in the art upon consideration of the accompanying specification, claims, and drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the figures:

FIG. 1 is a view in side elevation of the present device, parts thereof broken away and shown in sections;

FIG. 2 is a view in top plan of the present device slightly reduced in size;

FIG. 3 is an enlarged detailed view of the upper portion of the present device taken from FIG. 2, parts thereof broken away and shown in section;

FIG. 4 is a view in front elevation of the present device, parts thereof broken away and shown in section; and

FIG. 5 is a schematic diagram of the electrical circuitry used in the present device.

In the figures the numeral **10** generally designates a helmet completely constructed of rigid material which is capable of withstanding high impacts from foreign objects. The helmet **10** has a lower edge **11** and extends upwardly therefrom in a smooth continuous contour. An extreme upper portion, designated **12**, is constructed of light conducting material and may be transparent, translucent, etc. The remainder of the helmet **10**, which is designated **13**, joins the light conducting portion **12** at a juncture **14**. The portion **12** of the helmet **10** and the portion **13** may be formed from the same material and constructed as an integral piece or they may be constructed of different material and bonded together in some manner, such as welding, fusion, etc., well known to those skilled in the art. In this embodiment the helmet **10** is slightly elongated along the vertical axis so that it is shaped somewhat similar to a portion of an ellipsoid rather than a portion of a sphere. However, this shape is utilized for convenience in explanation and it should be understood that various shapes might be utilized depending upon the size of the components, to be described presently, and the characteristics of the light conducting material **12**. In any event it should be understood that the outer contour of the helmet **10** is smooth and continuous so that any foreign objects striking the surface thereof will be deflected.

The light source and energizing unit, generally designated **20**, includes a housing **21**, a plurality of rechargeable batteries **22** and a light bulb **23**. The light bulb **23** is a type commercially available with apparatus built in for periodically blinking or de-energizing the bulb **23**. The batteries **22** are preferably of the rechargeable type and the number and voltage thereof will depend upon the light bulb **23** associated therewith. The housing **21** is constructed of a lower substantially circular portion **24** and a mating cover **25** which slidably engages the lower portion **24** and clamps the components therein substantially immovable. The light bulb **23** is mounted substantially centrally within the cover **25** so that the glass portion and filament thereof extend above the cover **25**. The upper surface of the cover **25** may be coated with a reflective material to decrease the amount of light absorbed thereby. Also, if it is desired the cover **25** may be curved slightly upwardly to increase the

amount of light which is directed outwardly to the side of the helmet **10**. The opening containing the batteries **22** in the housing **21** is substantially rectangular shaped and the arcuate outer edges **26** are filled with a light plastic material or the like to aid in the prevention of movement of the other components therein.

The entire unit **20** is mounted with the upper surface of the cover **25** substantially in a plane with the juncture **14**. The unit **20** is mounted by means of a shoulder **30** extending around the inner periphery of the helmet **10** and forming a circular opening with an inner diameter substantially equal to the outer diameter of the housing **21**. The shoulder **30** may be constructed as an integral portion of the helmet **10** or may be attached in some fashion after the helmet **10** is constructed. A plurality of lugs **31** are fixedly attached onto the lower surface of the shoulder **30** by some means such as screws **32** or the like so that they overlap the inner edges of the shoulder **30** and lock the housing **21** fixedly in place. In some instances it might be desirable to make the housing **21** slightly concave at the upper surface and the lower surface to increase the amount of light reflected outwardly to the side of the helmet **10** and to allow slightly more room within the helmet **10** below the housing **21**. It should, therefore, be understood that the present embodiment of the light source and energizing unit **20** could be varied considerably and still be within the scope of this invention.

A schematic diagram for the electrical circuitry is illustrated in FIG. 5. In FIG. 5 one side of the light bulb **23** is connected to one side of the batteries **22** at a junction **35**. The other side of the batteries **22** is connected to one side of a plug **36** at a junction **37**. The other side of the plug **36** is connected to the junction **35**. The plug **36** is utilized to attach a charging unit to the batteries **22** to recharge the batteries **22** after long periods of use. The plug **36** is shown mounted at one side of the helmet **10** with a rotatably mounted cover **38** positioned thereover to protect the plug **36** from water and the like. When the plug **36** is to be utilized the cover **38** is rotated upwardly, as illustrated in dotted lines in FIG. 1, and a mating plug is inserted into the plug **36**. Referring again to FIG. 5, one side of a switch **39** is connected to the junction **37** and the other side is connected to the unconnected side of the light bulb **23**. In the illustrations the switch **39** is mounted adjacent the plug **36** and is utilized to manually energize or de-energize the light bulb **23**. It should be understood that the plug **36** and switch **39** are mounted on the outer surface of the helmet **10** in the illustrations but they might be mounted within the hat or in any of a variety of places.

Harness means **40** are mounted within the helmet **10** in the usual manner to prevent a wearer's head from contacting the helmet. In the present embodiment the helmet **10** is elongated somewhat in the vertical direction so that the distance between the harness means **40** and the light source and energizing unit **20** is sufficient to prevent the wearer's head from striking the unit **20** even though the helmet **10** is struck sharply with a foreign object.

Thus, a greatly improved illuminated safety helmet has been described which produces a blinking light that can be seen at all angles from the helmet so that the wearer will be quickly noticed by motorists and the like. The outer contour of the helmet is smooth and continuous so that the helmet deflects all objects which strike it and, therefore, protects the wearer from flying or falling objects and harmful blows from other sources. In addition, the present helmet can be quickly dismantled for maintenance and repair and means are provided whereby the batteries **22** can be recharged quickly and easily without dismantling the helmet.

While we have shown and described a specific embodiment of this invention, further modification and improvements will occur to those skilled in the art. We desire it to be understood, therefore, that this invention is not limited to the particular form shown and we intend in the appended claims to cover all modifications which do not depart from the spirit and scope of this invention.

What is claimed is:

1. An illuminated safety helmet comprising:

(a) a helmet constructed of a rigid material so that the outer surface thereof forms a smooth, substantially continuous contour from one edge to the other;

(b) a portion of said helmet being light conducting, said portion being adjacent the upper extremity and extending approximately 360° about the periphery of said helmet;

(c) harness means within said helmet for receiving the upper portion of a head therein and positioning the head within said helmet to substantially prevent the head from contacting the helmet; and

(d) a light source including a rechargeable battery mounted within the helmet for transmitting light through said light conducting portion of said helmet to an area encircling said helmet, said rechargeable battery having outlet means attached thereto for operatively attaching a recharging source of energy thereto without removing the battery from the helmet, said light source being positioned so that there will be no contact with a head positioned in said harness means.

2. An illuminated safety helmet substantially as set forth in claim **1** wherein the light source includes means for automatically, periodically energizing and de-energizing said source and switch means for manually energizing and de-energizing said source.

3. An illuminated safety helmet substantially as set forth in claim **1** wherein the light source is removably mounted for replacement of components.

4. An illuminated safety helmet substantially as set forth in claim **1** wherein the light source has an associated housing having a surface adjacent the light conducting portion of said helmet which surface has a reflective coating which is curved toward said portion.

5. An illuminated safety helmet including:

(a) a helmet constructed of a rigid material and formed so that the outer surface thereof has a smooth, substantially continuous contour from one edge to the other;

(b) a portion of said helmet adjacent the upper extremity thereof being light conducting, said light conducting portion extending about the periphery of said helmet sufficiently so that light transmitted therethrough is perceptible in approximately a 360° arc about said helmet;

(c) a light source removably fitted within said helmet so as to transmit light through said light conducting portion and so there will be no contact of the source with a head correctly positioned in said helmet, said light source including:

(1) a unitary, battery pack having a substantially flat form and removably positioned in said helmet to form a generally horizontal smooth wall which divides said helmet into an upper chamber and a lower head receiving cavity, said light conducting portion of said helmet constituting a portion of the walls of said upper chamber,

(2) said unitary pack containing a light bulb socket operatively connected to the battery and positioned so that a light bulb engaged therein will transmit light into said upper chamber and through said light conducting portion of said helmet, and

(3) a light bulb engaged in said socket.

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