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 do not 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 externally 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 section;
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 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 immovably. 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 outside outer edges 26 of the unit 20 is made by means of 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 theJun 19, 20, 30

inner perimeter 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 the harness 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 could be mounted on the upper 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 substantially prevents 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.

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 thereby 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 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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