# United States Patent [19]

**Koehler**

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[54] **COMBINATION HEAD AND CASE MOUNTED LIGHT**


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[52] **U.S. Cl.** ..... **240/60,** 240/6.4 W, 240/26, 240/10.63, 240/52.1

[51] **Int. Cl.** ..... **A42b 1/24**

[58] **Field of Search** ..... 240/6.4 R, 6.4 W, 59, 60, 240/26, 10.6, 10.66, 10.63, 52.1



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[57] **ABSTRACT**

A combination head and case mounted light apparatus including a lamp having a first velcro strip thereon. A headpiece is provided to be worn by a user and includes a second velcro strip for selectively cooperating with the first velcro strip to removably mount the lamp from the headpiece. A battery case is provided for carrying a battery to provide a power source for the lamp and such case includes a hand grasp portion so as to enable the case to be carried by the user. A third velcro strip is mounted on the carrying case for receipt of the first velcro strip to cooperate therewith to removably mount such lamp from the battery case. Consequently, the light device may be selectively mounted on the headpiece worn by a user or may, alternatively, be mounted from the battery case.


**8 Claims, 6 Drawing Figures**

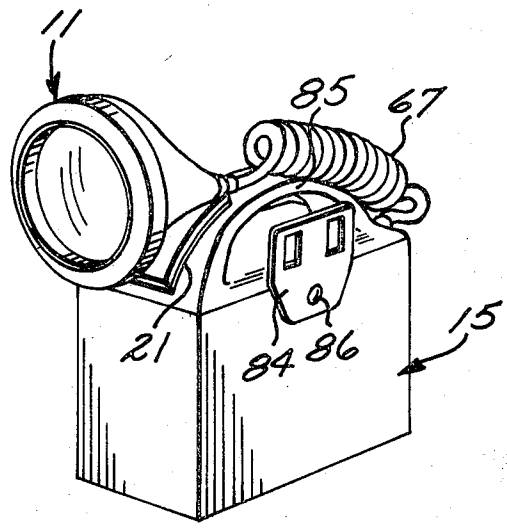


FIG. 1

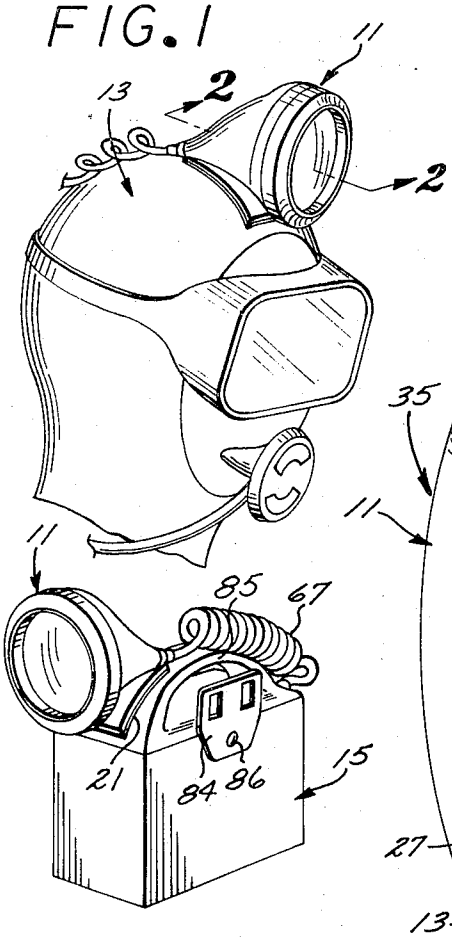



FIG. 6

FIG. 3

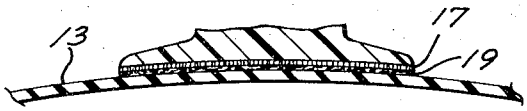



FIG. 2

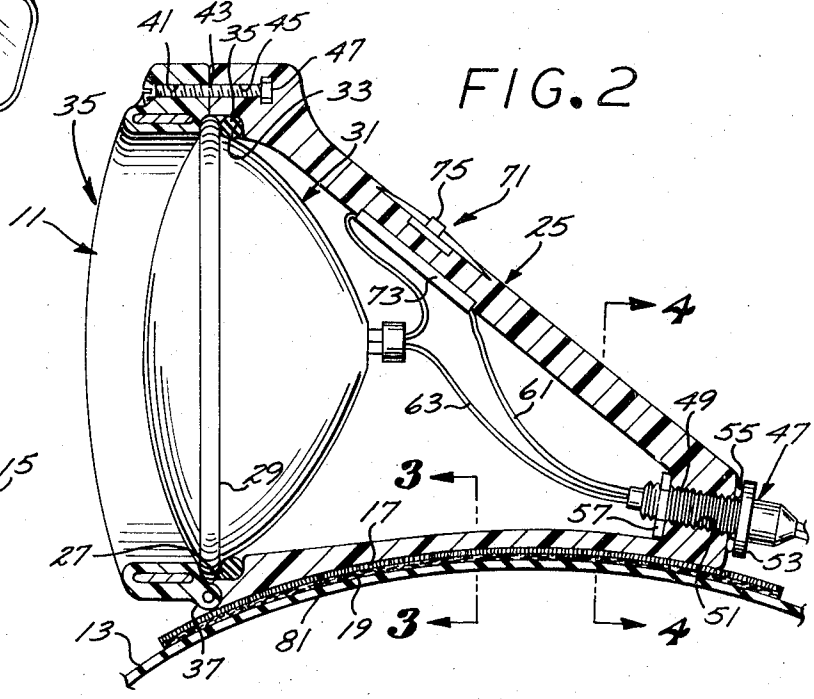
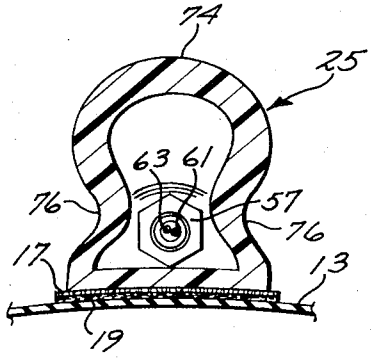



FIG. 4



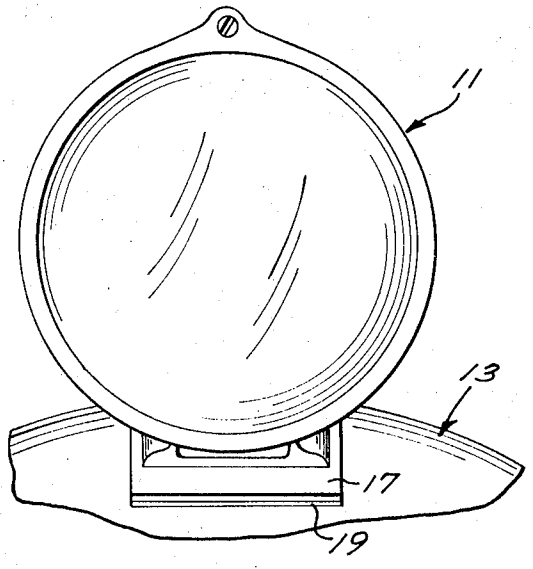




FIG. 5

# COMBINATION HEAD AND CASE MOUNTED LIGHT

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The combination head and case mounted light apparatus of the present invention relates to a lamp which may be mounted from the head of a user such as an underwater diver or a miner.

2. Description of the Prior Art

Head mounted lamps have been used for many years in the field of mining for illuminating the work area of a miner. Further, lights have been proposed for use by underwater divers but applicant is unaware of any prior art lighting devices which may be conveniently and rapidly mounted on either the head of the user or on a separate battery case which may be carried from the hand or belt of the user.

## SUMMARY OF THE INVENTION

The head and case mounted light apparatus of the present invention is characterized by a lamp which may be selectively mounted on the headpiece worn by a user or may be alternatively removably mounted from a battery case.

The objects and advantages of the present invention will become apparent from a consideration of the following detailed description when taken in conjunction with the accompanying drawing.

## DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a combination head and case mounted light apparatus embodying the present invention and depicting the light worn from the hood of an underwater diver;

FIG. 2 is a longitudinal sectional view, in enlarged scale, taken along the line 2—2 of FIG. 1;

FIG. 3 is a transverse sectional view, in enlarged scale, taken along the line 3—3 of FIG. 2;

FIG. 4 is a transverse sectional view taken along the line 4—4 of FIG. 4;

FIG. 5 is a front view, in enlarged scale, of a lamp included in the apparatus shown in FIG. 1; and

FIG. 6 is a perspective view of a lamp included in the apparatus shown in FIG. 1 and depicting such lamp mounted from a battery case.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 6, the combination head and case mounted light apparatus of the present invention includes, generally, a lamp 11 to be selectively mounted from a headpiece 13 of a user or from a separate battery case 15 carried by such user. The lamp 11 has a Velcro strip 17 mounted on the underside thereof for mating with a cooperating Velcro strip 19 mounted on the headpiece 13 which the user's hands are occupied with work tasks or, alternatively, such lamp may be mounted on the battery case 15.

In underwater applications such as diving of scuba divers at any appreciable depth, the surface light is substantially blocked out thus making artificial illumination of a diver's work area necessary. Further, at greater depths or in murky water, high powered light is necessary for adequate illumination of the work area. In applications of this type, the power source necessary for continued operation is relatively heavy thus dictating the necessity of mounting the power source separately from any head mounted lamp to avoid undue discomfort for the user.



Referring to FIG. 1 and 2, the head mounted lamp 11 includes a generally conically shaped housing 25 which may be constructed of plastic, or other suitable material. Such housing 25 is formed with a hollow interior terminating at its front extremity in a circular opening defining an inwardly and forwardly opening annular groove 27 for receipt of a rim 29 formed in the casing of a sealed high wattage bulb, generally designated 31. Formed adjacent the flange-receiving groove 27 is an O-ring groove 33 for receipt of an O-ring 35 which seals against the exterior of the lamp 31.

A ring-shaped bezel, generally designated 35, is mounted forwardly of the lamp 31 and is mounted on its lower side from the housing 25 by means of a hinge 37 (FIG. 2). Such bezel 35 is formed to overlie the mounting flange 29 of the lamp 31 and is formed on its upper side with a longitudinally extending through bore 41 for receipt of a locking screw 43 which projects into a blind bore 45 formed in the front extremity of the housing 25 to screw into a nut 47 embedded in such housing to thus lock the bezel 35 in its closed position shown in FIG. 2 to maintain the lamp 31 urged rearwardly in such housing and firmly seated against the sealing O-ring 35 to cooperate therewith and forming a watertight seal.

Mounted in the small end of the conically shaped housing 25 is a gland fitting, generally designated 47, and including a threaded tubular portion 49 received within a bore 51 formed in such housing. The fitting 47 is formed on one end with an annular integral ring 53 overlying the exterior of the housing 25 and having an O-ring 55 sandwiched thereunder. A nut 57 is screwed onto the interior end of the threaded tube 49 to hold the gland fitting 47 in position and to seal the bore 51 against introduction of water.

Positive and negative electrical leads 61 and 63 lead from the back side of the bulb 31 and through the gland fitting 47 and are covered by a water resistant coating to form a coil cord 67 leading from such housing to the battery case 15 (FIG. 7). Referring again to FIG. 2, the positive lead 61 includes a proximity switch, generally designated 71, mounted in the top wall of the hollow housing 25 and including an electrically conductive ferromagnetic element shiftable in a capsule 73 mounted on the interior of such housing 25 for shifting thereof in response to shifting of a magnetic switch button 75 mounted on the exterior of such housing 25.

Referring to FIG. 4, the exterior of the small end of the housing 25 is shaped to form a hand grasp portion 74 formed by a pair of depressions 76 formed in the opposite side thereof to provide a convenient hand hold whereby the lamp may be carried independent of both the hood 13 and battery case 15.

The underside of the housing 25 is in the form of a forwardly and rearwardly extending concavity 81 lined with the elongated strip of Velcro 17 to thus accommodate the convex shape of the hood 13 as it conforms to the wearer's head.

The battery case 15 may be of the type disclosed in my U.S. Pat. No. 3,791,875 to thus receive a wet cell battery. The case 15 includes an arcuate handle 85, such handle having the same general curvature of the concavity formed on the underside of the lamp housing

25 to cause the Velcro strip 21 mounted thereon to assume the same curvature as the Velcro strip 17 on such lamp housing to thus form a secure interlock between such Velcro strips.

The housing 15 is mounted from a belt fitting 84 by means of a swivel bolt 86, such belt fitting 84 being adapted to receive a skin diver's belt to enable the battery case 15 to be suspended from the diver's belt.

The headpiece 13 is a conventional rubber hood incorporated in a skin diver's suit and has the Velcro strip 19 disposed centrally thereon and mounted to extend in a forwardly-rearwardly direction.

In operation, a heavy duty battery may be housed in the battery case 15 and the lamp 25 mounted thereon as shown in FIG. 6 for convenient carrying of the apparatus to the site of the dive. When the diver has donned his hood 13 and is ready to submerge, the battery case 15 may conveniently be suspended from his belt by means of the bracket 84 and the lamp may be rapidly dismounted from the case 15 and secured to the diver's hood 13 by aligning the lamp mounted Velcro strip 17 over the hood mounted Velcro strip 19 and pressing the lamp 11 downwardly on the hood. It will be appreciated that the attitude of the lamp can easily be adjusted on the hood 13 by merely shifting such lamp forward or rearwardly with respect to such hood to thereby vary the inclination of such lamp thereon.

The diver may then descend into the ocean and as the light from the surface decreases during his descent sufficiently to require artificial illumination, he can switch the lamp 11 to its on condition by merely pressing the switch button 75 to its closed position thereby shifting the ferromagnetic element within the capsule 73 to the contact-closed position thereby completing a circuit through the illuminating element in the bulb 31. The diver may then continue his descent to his work or sporting area and his hands will be free to manipulate tools or the like while the area he faces is illuminated by the light 11.

If the occasion arrises, the lamp 11 may conveniently be removed from the hood 13 by merely gripping the lamp at the small end of the hand grasp portion 74 and pulling firmly up thereon to separate the Velcro strips 17 and 19 and the diver may then grasp such lamp and direct it in any desired direction for illumination of selected areas.

If the diver is to continue working in the same area for an extended period of time, it may be convenient to remove the battery case 15 from his belt and set such case on the ocean floor. The lamp 11 may be attached to the battery case 15 by placing it over the battery case Velcro strip 21 and firmly pressing it into position. The battery case 15 may then be oriented to cause the lamp 11 to be directed at the work area and the attitude of such lamp may be conveniently altered by merely shifting the lamp 11 forwardly or rearwardly on the curved handle 85. The diver will then be free to continue with his duties free of any hindrance by the lamp 11 or battery case 15.

From the foregoing it will be apparent that the combination light and case mounted lamp of present invention provides an economical and convenient means for illuminating a work area by means of a light which may be mounted either on the workman's head or on a battery case housing the power source for such lamp.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention.

I claim:

1. Combination head and case mounted light apparatus for use iwth a flexible diver's hood which assumes various convex curvatures corresponding with the heads of wearers, comprising:
- first mounting means attached to the hood and projecting forwardly and rearwardly over the top of said hood, said first mounting means being flexible so as to conform to various curvatures taken by said hood;
- a light device including a housing having one side formed with a concave curvature for complementally fitting said various convex curvatures of said first mounting means;
- a battery-powered lamp mounted on one end of said housing;
- second mounting means mounted within the concave curvature on said one side of said housing, said second mounting means being cooperative with said first mounting means in response to said first and second mounting means being pressed into oblique contact with one another to selectively mount said light device from said hood;
- a battery case including battery means and an exterior convex surface for complementaally interfitting said concave curvature on said one side of said housing;
- carrying means for carrying said battery case from said wearers;
- third mounting means on said convex curvature of said battery case and cooperative with said second mounting means in response to being brought into oblique contact therewith to selectively mount said light device from said battery case; and
- elongated electrical lead means leading from said light device to said battery whereby said hood may be worn by different wearers and will conform to the forward and rearward curvature of the heads of said wearers and said light device may be selectively mounted from said headpiece and said battery case.

2. Combination head and case mounted light apparatus as set forth in claim 1 wherein:
- said second mounting means is operative to be mounted from said first mounting means at selected locations along the curvature thereof for different attitutes of said light device.

3. Combination head and case mounted light apparatus as set forth in claim 1 wherein:
- said light device includes head hold means.

4. Combination head and case mounted light apparatus as set forth in claim 1 that includes;
- switch means mounted on said light device and connected with said lead means.

5. Combination head and case mounted light apparatus as set forth in claim 1 wherein:
- said lead means includes coil cord means.

6. Combination head and case mounted light apparatus as set forth in claim 4 wherein:
- said switch means is a ferromagnetic switch for making and breaking circuit between said battery and said lamp; and
- button means for controlling said ferromagnetic switch.

7. Combination head and case mounted light apparatus as set forth in claim 1 wherein:

said first mounting means includes a Velcro strip; and

said second and third mounting means includes respective Velcro strips operative to selectively grip said first mounting means.



8. Combination head and case mounted light apparatus as set forth in claim 1 wherein:

said battery case includes belt loop means for attachment to the belt of said user.

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