ILLUMINATING SPECTACLES FOR WORKING IN THE DARK

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ABSTRACT

In the known illuminating spectacles of binocular or monocular type the batteries for energizing the lamps and the means for switching on and off the lamps are disposed in a separate container which has to be carried together with the cables by the wearer. In this invention the batteries, as miniature batteries, as well as the switching means and the cables are disposed in the spectacle frame so that the user is not hindered in his work neither by a separate container nor by cables.

14 Claims, 8 Drawing Figures
The present invention relates to a support in spectacle form for a battery-operated lamp comprising at least one incandescent bulb and a switch for breaking the circuit between the latter and the batteries.

Such lamps, which are known as "illuminating spectacles", have the great advantage that, on the one hand, they leave the hands free for working in the dark, while on the other hand, by reason of the fact that they are disposed in the region of the worker's eyes, they direct the light beam immediately and automatically on to the working point. This is accompanied by the further advantage that the light can be concentrated on particular points.

There are a number of known forms of construction of such illuminating spectacles. More particularly, a distinction is drawn between binocular and monococular spectacles, depending upon the number of light sources. Preference is generally given to monococular spectacles, because they illuminate a defined region.

In all known illuminating spectacles, the batteries for the operation of the lamp are disposed in a separate container which has to be carried around by the wearer and in which the switch for switching the lamps on and off is also housed. The batteries are connected to the lamps through corresponding cables.

This of course involves inconveniences, because on the one hand the battery container must always be carried around and on the other hand the connecting cables are a hindrance to working.

This invention has for its object to obviate these disadvantages and to provide illuminating spectacles which are simple and cheap to manufacture.

This object is achieved in a support of the form described above substantially by virtue of the fact that the batteries are accommodated, as miniature batteries, in the spectacle frame, which is of conventional form.

Hence the separate container is not required, so that the user is not hindered in his work or in putting on or taking off the spectacles.

Preferably, the batteries are so secured in the hollow upper rim portion of the spectacles in such a manner that they may be replaced. In order to accommodate two or more batteries, the two upper rim portions of the spectacle frame desirably are made hollow.

In accordance with one embodiment of the invention, the upper rim portion may be constructed in box form and be adapted to be positively or non-positively closed by means of a cover, so that the batteries can be fitted and removed without difficulty.

Moreover, this construction affords the possibility of connecting in series the batteries disposed in the rim portions and of connecting them through the switch to an incandescent bulb disposed in the region of the bridge of the spectacles. The same construction may, of course, be chosen also for binocular illuminating spectacles.

In a particular construction, the box-form cavities of the upper rim portions of the spectacle frame comprise, at each of the ends closer to the incandescent bulb remote from the spectacle hinges, a contact for one battery pole, the two battery poles being connected through a wire sealed in the frame or extending through the hollow rim portions, so that a series connection is established.

The other pole of one battery is connected through a sealed-in contact member to the base pole of the incandescent bulb, and the other pole of the other battery is connected to the socket pole of the incandescent bulb.

Another feature of the invention which is applicable with advantage in combination with the main feature is that the switch is directly incorporated in the spectacle frame, so that no separate accessory part insulated from the spectacle frame is required.

In accordance with one embodiment of the invention, the switch actuating member is formed by the forward rim portion for the incandescent bulb. With advantage the switch is constructed as a rotary switch comprising a cylindrical switch body forming the forward rim portion, the switch body being so mounted in the spectacle bridge as to be rotatable and axially immovable. Movement in an axial direction may be prevented, for example, by catches or other positive connections which permit free rotation of the switch body. A contact lug for the socket pole of the incandescent bulb is sealed in the switch body. This contact lug extends through the switch body to the outside and can be connected to the corresponding battery pole by rotation of the switch body.

For this purpose, the battery pole may extend into the range of rotation of the switch body, for example through a contact member. In a preferred embodiment, the contact member is constructed as a hollow rivet and is embedded in the spectacle frame between one upper, hollow rim portion of the frame and the cavity for the switch body of the incandescent bulb. By rotation of the switch, one end of the contact lug can be connected to the hollow rivet, so that the circuit is closed.

In a preferred construction, the rivet head serves at the same time as a switch arresting means, that end of the contact lug which extends through the hollow body being curved and engaging in the hollow rivet head by means of its curvature in the closed-circuit position. The contact consequently constitutes at the same time the arresting means for the switch. In each other position, the incandescent bulb is disconnected.

In another construction, the switch body cooperates with a holder which is fixedly disposed in the spectacle frame and which comprises the contact lug for the base pole and the socket pole, as well as the screw thread for the lamp base. In addition, in construction, the switch body comprises contact bridges for establishing the electrical connection between one battery pole and the socket pole of the lamp, the said contact bridges becoming operative in particular positions of rotation.

As contact bridges, there are preferably employed balls which engage under spring pressure in corresponding recesses in the socket. In the region of at least one recess, one end of the contact lug for the socket pole of the lamp and the end of the contact member bearing against the battery pole are so arranged that the distance between these two ends can be bridged by the ball penetrating into the socket for closing the circuit.

Further features, details and advantages of the invention will become apparent from the following description of one embodiment and with reference to the accompanying drawings, in which:  FIG. 1 is a front elevation of the illuminating spectacles; FIG. 2 is a plan view of the illuminating spectacles;
FIG. 3 is a side elevation of the illuminating spectacles;

FIG. 4 is a section along the line IV—IV in FIG. 2;

FIG. 5 is a rear view of the switch shown in FIG. 4;

FIG. 6 is a section along the line VI—VI in FIG. 1;

FIG. 7 is a section, similar to FIG. 4, in the region of the hinge in construction; and

FIG. 8 is an axial section through a further construction of the switch body.

The constructions illustrated in the drawings constitute monocular illuminating spectacles, but the invention is applicable with the same advantage to binocular illuminating spectacles.

The illuminating spectacles comprise as a support a spectacle frame of conventional form, which thus consists of two upper rim portions 1, the bridge 2 and the bows or sides 4 pivotally connected to the upper rim portions by hinges 3.

The upper rim portions 1 are made wider than normal, as is apparent from the drawings, because they are hollow. The cavities 5 in the rim portion are indicated in FIG. 4 and in them there are disposed in the upper rim portions 1 batteries 6 for the operation of the illuminating spectacles. These batteries are so-called miniature batteries supplying a voltage of preferably 1.5 volts. The cavities 5 may be adapted to the cylindrical form of the batteries, or they may at least comprise a number of ridges of like form on which the batteries lie.

As is apparent from FIG. 2, the rim portions of the spectacle frame are of box form and are sealed at the top by covers 7. Each cover, the exact form of which is not shown, may be secured to the corresponding rim portion, for example by clips, detents or the like. The cover may also be provided on the rear side opposite to the forward side of the spectacle frame.

Each of the cavities 5 which receive the batteries 6 has on its end wall 20, FIG. 6, adjacent to the spectacle hinge a contact member 8 for one pole of each battery. The contact member 8 may, for example, be sealed in the material of the rim portion with the aid of a hollow rivet 9. The two contact members in the cavities are connected together by means of a cable (not shown), which, for example, is also embedded, so that the batteries are connected in series. The other pole of one battery is connected by means of a contact member 10 (FIG. 4) to a contact 11 for the base pole of the incandescent bulb.

The other pole 12 of the other battery 6 is connected to a contact 14 for the socket pole of the incandescent bulb through a hollow rivet 13.

The incandescent lamp is mounted in a socket 15 situated in the region of the bridge 2 of the spectacle frame and it extends through a forward rim portion 16 which is so mounted in the bridge 2 as to be rotatable but axially non-displaceable. This forward rim portion 10 forms at the same time the switch for switching the incandescent bulb on and off. For this purpose, it comprises a ring 17 through which the contact 14 constructed as a lug extends to the outside. That end 18 of the contact lug 14 which is further from the socket of the incandescent bulb is curved, as may be seen from FIGS. 4 and 5. By means of this curved region 18, the contact lug 14 engages in the aperture 19 of the hollow rivet 13, so that a definitive circuit-closing position is obtained. By rotating the forward rim portion 16, which movement is followed by the ring 17, the contact between the contact lug 14 and the battery pole 12 is established or broken.

By appropriate construction of the forward rim portion 16, the position of the switch may also be checked from the outside. For example, the forward rim portion 16 is for this purpose so shaped in the region in which it extends beyond the spectacle frame as to differ from the cylindrical form. In the two registering positions, the switch is closed and opened respectively.

FIG. 7 shows a construction which is modified in relation to FIG. 6 and in which the contact member corresponding to the contact is formed by a head of a rivet 22 bearing against a battery pole 21. A wire 23 which establishes the series connection extends from the rivet 22 to the other pole of the second battery. In order to establish the necessary contact pressure, the rivet 22 is fitted in a yieldable cross member 24 which extends into recesses in the forward and rear walls 25, 26 of the forward rim portion of the spectacle frame.

FIG. 8 shows a switch member which is modified as compared with FIGS. 4 and 5. A switch member 30 which at the same time comprises the forward rim portion for the incandescent lamp, cooperates with a socket 32 for a lamp base 33, the socket being fixedly mounted in the rim of the spectacles. The socket 32 is fixedly mounted on a plate 35 which is secured to pin 34 and which in turn is secured to the spectacle frame.

A contact lug 36 for the base pole of the lamp 31 is embedded in the socket 32. The contact lug is made of a sheet-metal strip, the other end 37 of which bears against the pole 39 of one battery 38. In addition, a contact lug 40 for the socket pole of the lamp 31 is embedded in the socket and terminates in an end recess in the socket. Also in this recess a contact member 41 terminates which is also disposed in the socket and against which the other pole 42 of the other battery 43 bears.

The distance between the two ends of the contact lug 40 and the contact member 41 in the recess in the socket 32 is such that it can be bridged by a ball 44 which closes the circuit under the pressure of a spring 45. Depending upon the number of balls 44 disposed between the contact 41 and the switch member 30, the switch comprises a number of circuit-closing positions. The balls 44 also serve as retaining means for holding the switch member 30 in its “on” and “off” positions.

The construction described above is not only particularly favorable in its application, but it is also simple to manufacture. The various parts of the spectacle frame are produced, together with the necessary conductors and contact members, by injection moulding, pressing or the like, preferably from plastics, so that the electric terminal connecting members are fixedly located. The advantages as compared with the known illuminating spectacles will be particularly apparent from the illustrations in FIGS. 1 and 2 and from the switch design illustrated in FIGS. 4, 5 and 8, since no separate accessories are now required.

IN THE CLAIMS:
1. A support in the form of spectacles for a battery-operated light, more especially for repair purposes, said spectacles having upper rim portions on the frame thereof, comprising: at least one incandescent lamp and a switch centrally located between said upper rim portions in the area of the bridge of the spectacle.
frame, for breaking the circuit between the lamp and miniature batteries for powering said lamp, the support being characterized by a pair of hollows in the upper rim portions above the left and right eyes, for receiving respective batteries, each hollow being constructed in box form and being provided with a cover for closing the same, so that batteries provided in said hollows can be replaced and further including means for connecting said batteries in series, so as to energize said lamp.

2. A support as claimed in claim 1, in which the box-form hollows in the rim portions each comprises at its end further from the incandescent lamp and closer to the spectacle hinges, provided adjacent said upper rim portions, a contact for one battery pole, the two contacts being connected by means of a wire which is sealed in the spectacle frame or extends through the hollow rim portion.

3. A support as claimed in claim 2, in which the other pole of one battery is connected to the base pole of the incandescent lamp by means of a sealed-in contact member, while the other pole of the other battery is connected to the socket pole of the incandescent lamp by means of the switch.

4. A support as claimed in claim 3, in which a switch-actuating member is formed by a forward rim portion for the incandescent lamp.

5. A support as claimed in claim 4, in which the switch is a rotary switch and comprises a cylindrical switch body which forms the forward rim portion for the incandescent lamp and the actuating member.

6. A support as claimed in claim 5, in which the switch body is so mounted in the spectacle bridge as to be rotatable and axially immovable.

7. A support as claimed in claim 6, in which a contact lug for the socket pole of the incandescent lamp is embedded in the switch body.

8. A support as claimed in claim 7, in which the contact lug extends through the switch body to the outside and is adapted to be connected to the corresponding battery pole.

9. A support as claimed in claim 8, in which the battery pole extends through a contact member into the range of rotation of the switch body and the contact lug.

10. A support as claimed in claim 9, in which the contact member consists of a hollow rivet and is embedded in the spectacle frame between the hollow upper rim portion of the frame and a cavity for the switch body of the incandescent lamp.

11. A support as claimed in claim 10, in which the rivet head serves at the same time as a switch arresting means, in that that end of the contact lug which extends through the switch body is curved and by means of its curvature engages in the hollow rivet head in the "on" position of the switch.

12. A support as claimed in claim 6, in which the switch body cooperates with a holder which is fixedly disposed in the spectacle frame and which comprises contact lugs for the base pole, the socket pole and the screwthread for the lamp, and wherein the said switch pole comprises contact bridges operative in particular positions of rotation to establish the electrical connection between one battery pole and the socket pole of the lamp.

13. A support as claimed in claim 12, which comprises balls as contact bridges, the balls engaging under spring pressure in corresponding recesses in the socket.

14. A support as claimed in claim 13, in which in the region of at least one recess, one end of the contact lug for the socket pole of the lamp and the end of a contact member bearing against the battery pole are so disposed that the distance between them can be bridged by the balls penetrating into the recess for closing the circuit.