

- [54] **EYE PROTECTOR FOR WELDERS**
- [75] Inventor: **Clarence C. Bush**, Bel Air, Md.
- [73] Assignee: **The United States of America as represented by the Secretary of the Army, Washington, D.C.**
- [22] Filed: **Aug. 29, 1972**
- [21] Appl. No.: **284,534**

Related U.S. Application Data

- [63] Substitute for Ser. No. 103,975, Jan. 5, 1971, abandoned.
- [52] U.S. Cl. **219/147, 219/130**
- [51] Int. Cl. **B23k 9/32**
- [58] Field of Search **219/147, 130**

References Cited

UNITED STATES PATENTS

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Primary Examiner—Thomas J. Kozma
Attorney, Agent, or Firm—Edward J. Kelly; Herbert Berl

[57] **ABSTRACT**

A fail-safe eye protector for welders consisting of a spring loaded, darkened window-hinged over a clear glass window on a welder's hood and an electrode hand holder having a spring loaded grip switch bridging a pair of contacts when fully closed. One contact is in circuitry with a solenoid mounted on the hood while a second circuit connects a micro-limit switch, operated by the darkened window, to the other contact. When the grip switch is pressed to the first contact the solenoid closes the darkened window and when pressed fully closed it bridges both contacts to strike the arc. Full release of the grip switch breaks both circuits and the darkened window opens. A safety switch in the secondary circuit prevents malfunction of the system.

3 Claims, 2 Drawing Figures

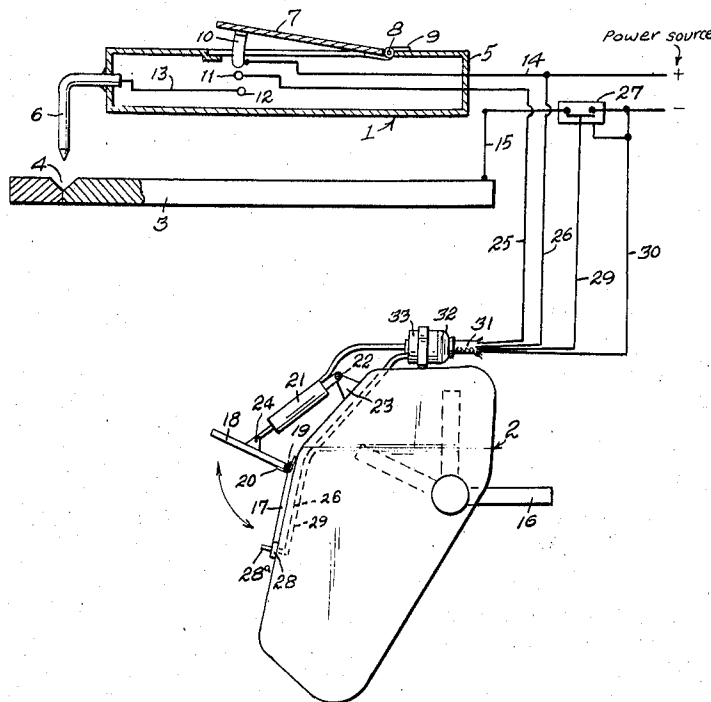


Fig. 1.

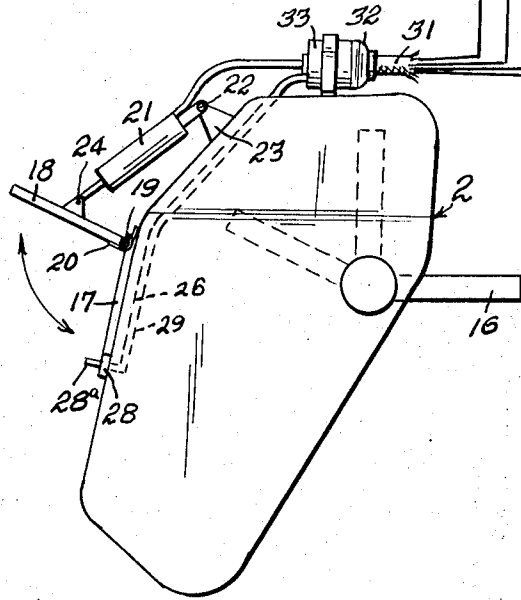
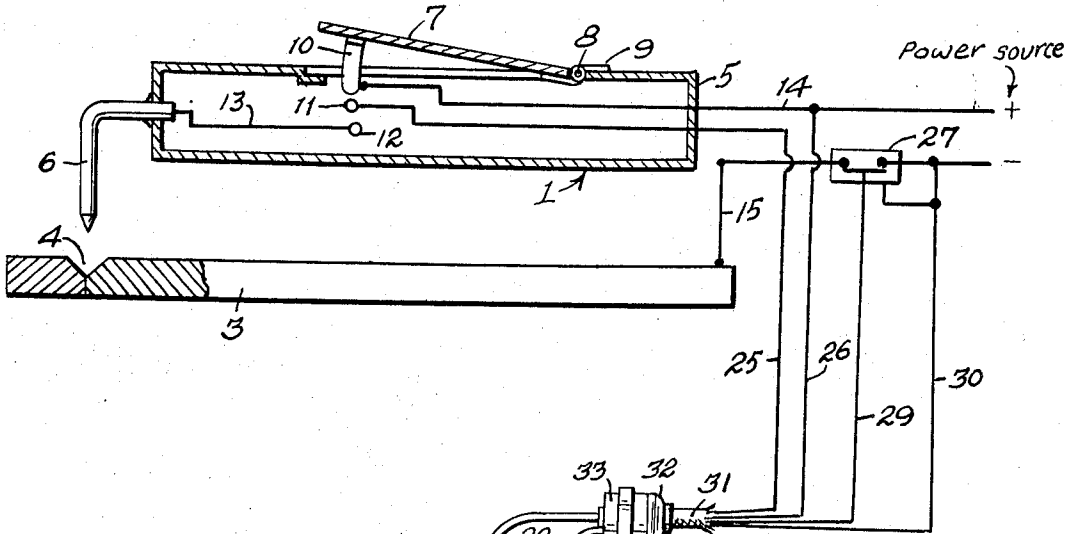
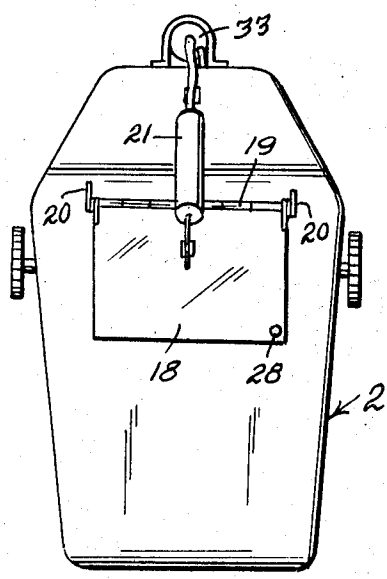


Fig. 2.



INVENTOR,
Clarence C. Bush

BY: Harry M. Baragovitz,
Edward J. Kelly &
Herbert Bert ATTORNEYS.

EYE PROTECTOR FOR WELDERS

This application is a substitute for Ser. No. 103,975 filed Jan. 5, 1971, now abandoned.

The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to an eye protector for welders and more particularly to a fail-safe means of protecting the welder's eyes at all times while the arc is being struck. Usually welders wear a hood having a darkened glass window which absorbs most of the ultraviolet radiation while permitting passage of sufficient safe wavelengths to allow continued visibility during the welding operation. At times during the welding operation the welder may desire to inspect the progress of the operation and must either remove the hood or snap the head to flip the hood up to a raised position. When using a hand held electrode both hands are usually necessary to perform the welding operation and the welder cannot spare one of his hands to raise the hood, or else he may be in a position to prevent flipping the head to throw the hood upwards. Again, the welder may forget to extinguish the arc before the hood is raised or yet lay the electrode down with the arc still burning.

The present invention is designed to compensate for the aforesaid situations and hazards by providing a welding outfit having a handgrip switch in the electrode handle which, when pressed, will automatically close a darkened window over the clear window of the welder's hood before an arc is struck by the electrode. The arc is extinguished upon full release of the grip switch.

It is therefore a principal object of this invention to provide a fail-safe means for protecting the eyes of a welder as long as the welding arc is burning.

Another object is to provide a welding outfit having manually operated means in the electrode handle to automatically close a darkened window on the welder's protective hood before the welding arc is struck.

A final object is to provide a safety switch operated by the closing of the darkened window to close the arc circuit.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawing, in which:

FIG. 1 is a somewhat schematic elevational view of welding system in accordance with this invention, and,

FIG. 2 is a front elevation of the hood per se, the darkened window shown as closed.

Referring in detail to the drawing in which like reference characters designate like parts throughout the several views, 1 indicates generally, the electrode holder of the welding outfit and 2 indicates generally, the welder's hood. A workpiece 3 is shown having a weld area 4. Handle 1 consists of a handgrip 5 of electrical insulating material having an electrode tip 6 fixed to grip 5 as is usual in welding equipment. A single pole double contact switch 7 is mounted in grip 5 by a hinge 8 and is biased outward by a spring 9, as shown. Switch 7 is provided on its underside with a single pole 10. A pair of contacts 11 and 12 are shown below pole 10. Contact 12 is connected to electrode 6 by a lead 13 and pole 10 is connected to a power source by lead 14. A

ground contact may be made with workpiece 3 by a lead 15.

Hood 2 is a standard welder's item having an adjustable headband 16 and a clear window 17 to protect the welder's eyes when the arc is not being used. A darkened window 18 is hinged over the clear window as at 19. Window 18 is normally biased to an open position by springs 20. A solenoid 21 is pivoted at one of its ends as at 22 to a bracket 23 on hood 2 and at its other end as at 24 to window 18.

Solenoid 21 is electrically connected to the switch elements in handgrip 5 by a lead 25 which is connected to contact 11 and a lead 30 connected to lead 15.

A secondary circuit is provided to operate a safety relay switch 27 and is operated by a micro-limit switch 28 operated by a plunger 28a which is connected by a lead 29 to switch 27 and a lead 26 from inlet lead 14.

Leads 25, 26, 29, and 30 may be carried by a flexible insulated electric cord having outdoor specifications, a portion of which is indicated by 31. A plug connected to the leads may be inserted in a socket 32 attached to the hood 2 so that the handle 1 may be quickly connected or disconnected from the hood 2 at will.

OPERATION

In use, the welder, wearing hood 2, will press the spring biased switch 7 in handgrip 5 to bring its pole 10 in contact with contact 11. This will energize the primary, or window circuit to energize solenoid 21 to close window 18. As the window 18 closes, it presses micro-switch 28 to close and energize the secondary, and/or arc circuit. Relay 27 closes and the circuit is now ready for the electrode to produce the arc which is done by further pressing switch handle 7 to bring pole 10 into contact with both contacts 11 and 12. This strikes an arc. Thus the eyes of the welder will remain protected as long as the handle 7 is fully pressed to obtain the arc. Should, by accident, the window 18 opens, the arc would be immediately extinguished by the opening of micro-switch 28 and relay 27. Full release of handle 7 breaks both circuits.

Since the switch handle 7 and its pole 10 energize the primary and secondary circuits in sequence, it is not possible to energize both circuits simultaneously therefore rendering a fail-safe protection to the eyes of the welder.

Even if the operator presses the grip handle switch 7 fully closed, darkened window 18 will be closed at once and before the arc is struck, since the arc cannot be struck until the window 18 is closed. Since the operation of the window 18 is fully automatic, it will protect the eyes of the welder at all times, even careless handling of the electrode handgrip such as dropping it, etc.

What is claimed is:

1. A welder's protective device comprising a face hood and electrode holder, said hood including a viewing portion together with screening sheet having movement actuating means and solenoid restraining means associated therewith; a first terminal in the electrode holder with electrical conducting means connecting the solenoid thereto and defining the solenoid circuit, electrode mounting means in the holder defining a second terminal and forming part of an arc circuit, and power receiving means also positioned therein; switch means in said electrode holder active in one position to selectively connect the power receiving means solely to the solenoid circuit for releasing the solenoid restraining

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means and active in a second position to connect the arc circuit through the solenoid circuit whereby the screening sheet may be operated independently of the electrode holder while maintaining the operation of the electrode holder dependent upon a closed solenoid circuit and the release of the screening sheet.

2. A protective device according to claim 1 including a micro switch in the arc circuit, an auxiliary circuit operable to actuate the micro switch when closed and plunger means on the face hood adjacent the closing terminus of the screening sheet and defining a safety

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switch in the auxiliary circuit, said plunger closing the auxiliary circuit when depressed by the screening sheet to effect the closing of the arc circuit whereby the operation of the electrode holder is further dependent upon the complete closing of the face hood viewing portion by the screening sheet.

3. A protective device according to claim 2 including means for separation of the electrical circuitry between the hood and the electrode holder.

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