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(11) **EP 1 045 353 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.10.2000 Bulletin 2000/42

(51) Int. Cl.⁷: **G08B 13/183**

(21) Application number: **00107054.9**

(22) Date of filing: **04.04.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **16.04.1999 IT TV990019**

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(54) **Photocell**

(57) A photocell comprising a box-like body (2) constituted by a first half-shell (3) and by a second half-shell (4) which can be mutually coupled. Inside the first half-shell (3) there is a support (10), for example for a light source (11), which rotates about a first vertical axis. The light source (11) in turn selectively rotates on a second axis which is perpendicular to the first axis.

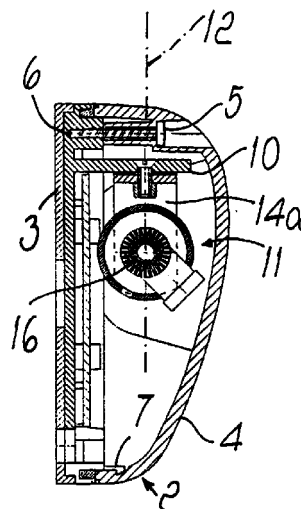


FIG. 4

Description

[0001] The present invention relates to a photocell.

[0002] Photocells are currently known which substantially comprise a box-like body constituted by a first half-shell and by a second half-shell which can be mutually coupled.

[0003] Suitable electric devices which comprise a light source are associated at the first half-shell.

[0004] The second half-shell has instead a transparent region which allows the light beam to pass.

[0005] Photocells are known which are used for example to protect a work area, for example road barriers or gate wings or other moving mechanical elements, allowing or preventing the opening of the mechanical element in case of presence of people or objects, in practice monitoring the work area.

[0006] These photocells have an infrared light source or a receiver of an optical signal which are fixed; although they have low manufacturing costs, these solutions require considerable care during installation, since it is indispensable to arrange the photocell so as to affect, with its light beam, a suitable receiver; therefore the margin of error in installation is extremely low, on penalty of practically not using the photocell.

[0007] Moreover, this solution has other drawbacks; if the user wished to protect access for different angles or on different planes, he would be unable to do so; alternatively, the location of the photocell would have to be changed.

[0008] As a partial solution to this drawback it is known to provide a photocell which comprises an infrared light source which, in order to protect the work area, can be subjected for example to an adjustment of the light beam on a vertical plane; it is known to arrange inside the photocell, for this purpose, a mirror which by rotating can alter the orientation of the beam.

[0009] However, this solution too has considerable drawbacks, such as the possibility that the glass may become opaque, or that moisture may be present and may deposit on the mirror, possibly refracting the beam.

[0010] Instability in the arrangement of the mirror has also been noted; due to vibrations applied for example during the transit of vehicles, the mirror may change its angle.

[0011] The aim of the present invention is to solve the above-noted drawbacks, eliminating the drawbacks of the cited prior art, by providing a photocell which allows the user to vary the regions to be protected by modifying the orientation of the light beam even after the photocell has been installed, all this being achieved in optimum operating conditions and therefore with constant positioning of the beam even in case of accidental impacts and/or vibrations applied accidentally to the photocell.

[0012] Within the scope of this aim, an object of the present invention is to provide a photocell which has a reduced volume and is therefore structurally compact.

[0013] Another object of the present invention is to provide a photocell in which the angle that can be given to the light beam can be modified quickly and easily.

[0014] Another object of the present invention is to provide a photocell which combines with the preceding characteristics that of being reliable and safe in use and of having low manufacturing costs.

[0015] This aim, these objects and others which will become apparent hereinafter are achieved by a photocell which comprises a box-like body constituted by a first half-shell for containing electronic devices and by a second half-shell which has a region which allows the passage of a light beam, characterized in that inside said first half-shell there is a support which is mounted on a first vertical axis and is meant to support a projector or receiver element which is in turn selectively mounted on a second axis which is perpendicular to said first axis.

[0016] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a particular embodiment thereof, illustrated in the accompanying drawings, wherein:

Figure 1 is a side view of the photocell according to the invention;

Figure 2 is a front view of the photocell;

Figure 3 is a front view of the photocell, with the second half-shell omitted for the sake of clarity;

Figure 4 is a sectional view, taken along the plane IV-IV of Figure 3;

Figure 5 is a sectional view, taken along the plane V-V of Figure 3;

Figure 6 is a sectional view, taken along the plane VI-VI of Figure 3.

[0017] With reference to the above figures, the reference numeral 1 designates the photocell according to the present invention, which comprises a box-like body 2 constituted by a first half-shell 3 and by a second half-shell 4 which can be mutually coupled by means of adapted screws 5 which can be associated, for example, frontally to the second half-shell 4; the stem of the screws can be associated at adapted first seats formed in a first half-shell 3.

[0018] The connection between the first half-shell and the second half-shell can furthermore be facilitated by the presence of adapted tabs 7 which protrude therefrom along its perimeter and are substantially L-shaped, with a free end which can be inserted at complementarily shaped second seats 8 formed inside the second half-shell 4.

[0019] Suitable electronic devices 9, such as for example electronic circuits, can be arranged within the first half-shell 3; a supporting wing 10 further protrudes toward the second half-shell 4 proximate to the upper end of the first half-shell 3 and supports a light source such as a projector element or a receiver element, des-

ignated by the reference numeral 11; the projector element can be constituted by an infrared light source, while the receiver element can be constituted by a receiver for an optical signal.

[0020] A substantially C-shaped fork 13 is pivoted at right angles to the wing 10 and therefore at a first axis 12; its second wings 14a and 14b are directed away from the wing 10.

[0021] The light source 11 is rotatably associated between the second wings 14a and 14b and rotates at a second axis 15 which is perpendicular to the first axis 12.

[0022] Such rotation can be set selectively by the user, since means are provided which are suitable to discriminate the angular arrangement of the photocell; said means are constituted by suitable sets of teeth 16 and complementary sets of teeth 17 which protrude respectively from the lateral surfaces of the light source 11 and from the internal lateral surfaces of the second wings 14a and 14b of the fork 13.

[0023] A semitransparent region 18 is formed at the light source 11 at the second half-shell 4 and is adapted to allow the passage of the light beam.

[0024] It has thus been observed that the invention has achieved the intended aim and objects, a photocell having been provided which can be installed and therefore positioned without special care, since the light beam can be positioned rapidly and in an optimum manner by the operator by turning the fork 13 in order to orientate it on a horizontal plane and by turning the light source 11 in order to orientate it on a vertical plane.

[0025] The presence of the complementary set of teeth 17 and of the set of teeth 16 further allows to stably select the arrangement of the light source 11 on the vertical plane, thus making the photocell free from malfunctions caused by vibrations and/or accidental impacts.

[0026] The resulting photocell is furthermore merely very compact as well as reliable and safe in use and has low associated costs.

[0027] The materials and the dimensions that constitute the individual components of the photocell may of course be the most pertinent according to specific requirements.

[0028] The disclosures in Italian Utility Model Application No. TV99U000019 from which this application claims priority are incorporated herein by reference.

[0029] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A photocell comprising a box-like body constituted

by a first half shell for containing electronic devices and by a second half-shell which has a region which allows the passage of a light beam, characterized in that inside said first half-shell there is a support which is mounted on a first vertical axis and is meant to support a projector or receiver element which is in turn selectively mounted along a second axis which is perpendicular to said first axis.

2. The photocell according to claim 1, characterized in that a supporting wing for said projector element or receiver element protrudes inside said first half shell, proximate to the upper end and toward said second half-shell.

3. The photocell according to claim 2, characterized in that a substantially C-shaped fork is pivoted at right angles to said wing at a first axis which is perpendicular thereto, the wings of said fork being directed away from said supporting wing.

4. The photocell according to claim 3, characterized in that said projector element or receiver element is rotatably associated between said wings of the fork and rotate at said second axis which is perpendicular to said first axis.

5. The photocell according to claims 1 and 4, characterized in that the rotation on said second axis can be set selectively by the user, means being provided to discriminate the angular arrangement of said projector or receiver element, said means being constituted by sets of teeth and complementary sets of teeth which protrude respectively from lateral surfaces of said projector or receiver element and from internal lateral surfaces of said wings of the fork.

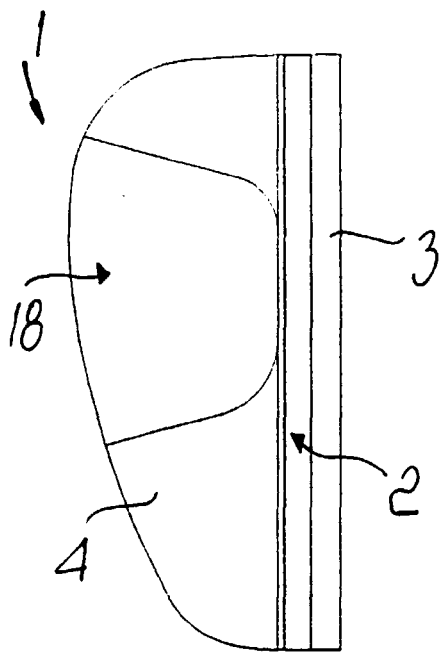


FIG. 1

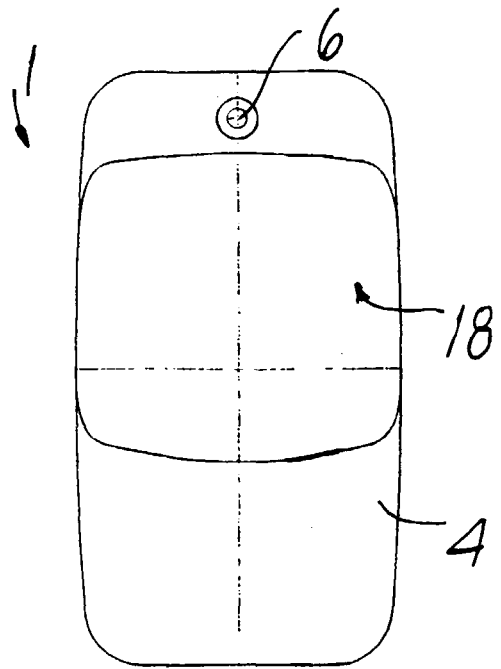


FIG. 2

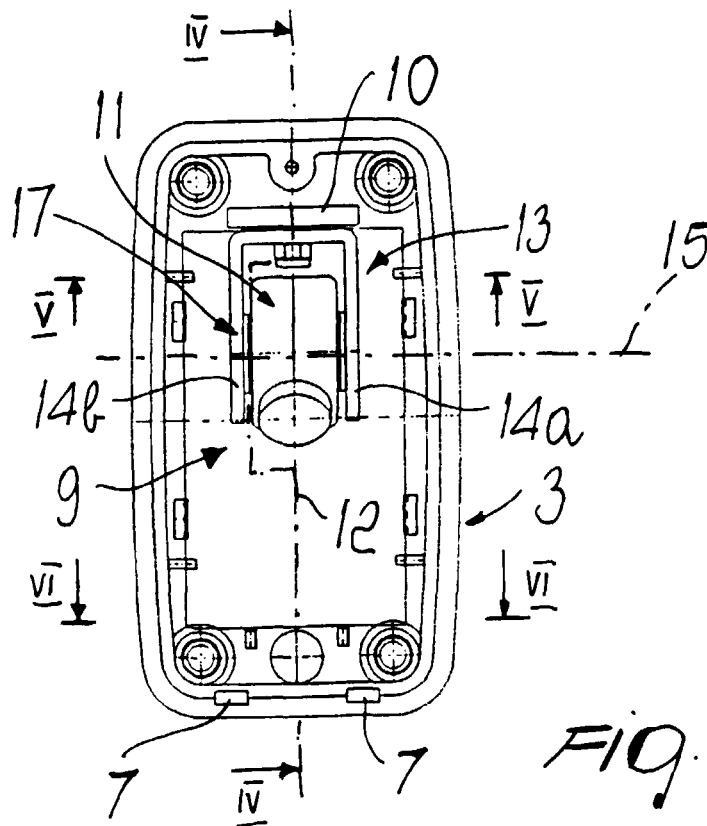


FIG. 3

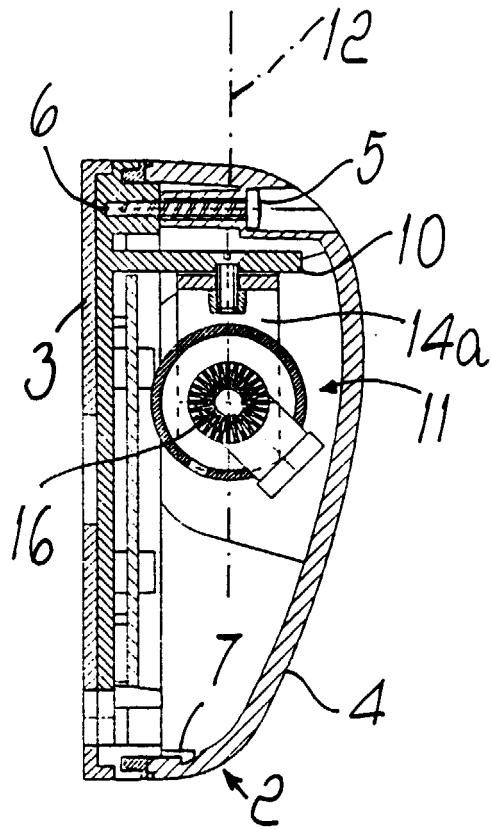


FIG. 4

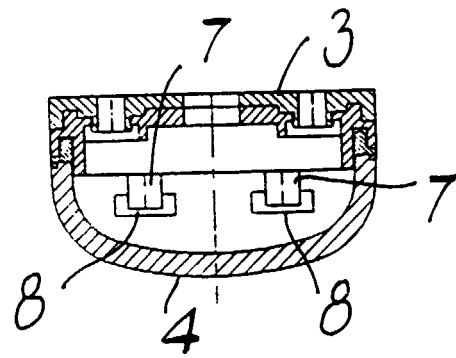


FIG. 6

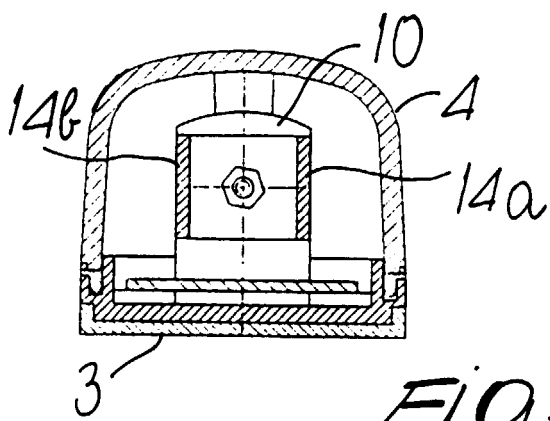


FIG. 5