(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 958 094 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
23.12.2015 Bulletin 2015/52

(21) Application number: **14751956.5**

(22) Date of filing: **12.02.2014**

(51) Int Cl.:
G08G 1/005 *(2006.01)* ***H01H 35/00*** *(2006.01)*

(86) International application number:
PCT/ES2014/070101

(87) International publication number:
WO 2014/125149 (21.08.2014 Gazette 2014/34)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **13.02.2013 ES 201330170**

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(54) STAND-ALONE ILLUMINATED SIGNALLING DEVICE FOR PEDESTRIAN CROSSINGS

(57) The invention relates to a stand-alone illuminated signalling device for pedestrian crossings, comprising a LED light (10) installed on one side of the pedestrian crossing (9) and two motion sensors (7), one located on each side of the crossing (9). The circuit is autonomously powered by a photovoltaic panel (2) connected to a consumption and load voltage regulator (3) of a battery (4). The invention also comprises a twilight cell (5) connected to the general switch (6) of the circuit so that the device is only activated at dusk, during hours of darkness or in bad light conditions. The motion sensors (7) are connected to three relays and to the LED light (10) so that the light flashes for a programmed period of time.

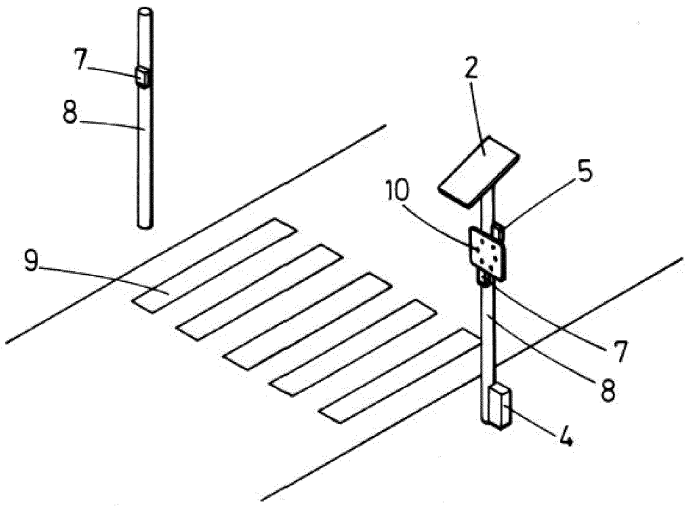

FIG.1

EP 2 958 094 A1

Description

OBJECT OF THE INVENTION

[0001] The invention, as exposed on the wording of the present specification, relates to a stand-alone illuminated signalling device for pedestrian crossings, which constitutes a remarkable novelty within its field of application and provides the function to which it is intended several advantages as well as novelty characteristics inherent to its arrangement and constitution, which will be described in detail below.

[0002] More particularly, the object of the invention focuses on a stand-alone illuminated device whose purpose lies on being configured as night signalling device for alerting the drivers about the presence of pedestrians in the borders of similar zebra crossings or pedestrian crossings without traffic lights, allowing to sense their presence and intention of crossing in order to slow down and stop the vehicle with safety.

[0003] The device, besides, presents the advantage of being stand-alone as it is fed by solar energy, wherefore it has no cost for electric consumption and, furthermore, it can be installed in any area, both urban and inter-urban.

APPLICATION FIELD OF THE INVENTION

[0004] The application field of the present invention is framed within the sector of the industry intended to manufacturing of apparatus and devices of road signalling, focusing particularly on the ones of type illuminated and fed by solar energy.

BACKGROUND OF THE INVENTION

[0005] As it is known, car hits to pedestrians are the first cause of death by car accident in cities. Invariably from 2003, car hits cause more than 40% of casualties by car accident in urban areas and 15% of injured. We know that, from 70Km/h, a car hit is usually a certain death, while at 50Km/h death risk decreases to 75% and at 30Km/h three out of every four car hits can be avoided.

[0006] One of the problems of said car hits is that, besides in inter-urban pedestrian crossings, small villages or even in many areas of big cities, there are areas that by night are not well lit or are not lit at all, making, if the crossing has no traffic light, it very difficult to drivers to distinguish the presence of pedestrians about to crossing, making it too many times impossible to stop the vehicle in time to avoid hitting them. Said problem also occurs, when weather conditions cause adverse meteorological phenomena which favour poor visibility conditions.

[0007] The object of the present invention is, then, developing a system which avoids said inconvenient, which is cheaper to install and maintain than a conventional traffic light, but which serves as an improved substitute therefor for automatically detecting the presence of pedestrians in the poor lit crossings, alerting the drivers about their presence sufficiently in advance.

[0008] Mention must be made, on the other hand, that at least by the applicant, it is unknown the existence of any other stand-alone illuminated signalling device for pedestrian crossings or any other invention with similar application presenting technical, structural and constitutive characteristics similar to the ones presented by the device herein recommended, as it is claimed.

EXPLANATION OF THE INVENTION

[0009] The stand-alone illuminated signalling device for pedestrian crossings proposed by the present invention is configured as a remarkable novelty within its field of application, as, according to its implementation and unequivocally, the objects above pointed are satisfactorily achieved, being the characterizing details suitable making it possible, enclosed in the final claims accompanying the present specification thereof.

[0010] Specifically, the device proposed by the invention is configured as a flashing illuminated device which, under conditions of poor brightness, and especially by night, alerts the drivers about the presence of pedestrians close to any of both sides of a pedestrian crossing or crossing without traffic light.

[0011] To this end, the device incorporates a twilight cell through which it will begin to work at dusk being active until dawn and as long as light conditions are poorer than those which are normal or predetermined as sufficient.

[0012] Furthermore, the device has motion sensors which will be conveniently installed at both sides of the crossing, so that, in case of the presence of people in any of said sides, the lighting system is activated.

[0013] Said lighting system, preferably, flashes and is composed of at least a LED light.

[0014] Additionally, and according to another one of the characteristics of the device of the invention, this is stand-alone, for which it is electrically fed through a photovoltaic panel which is conveniently connected to a storage battery for accumulating the solar energy collected during the daylight hours and provide it to the circuit for actuating it during the night.

[0015] With this device, which does not need connection to the mains power supply as it is fed by solar energy, any pedestrian crossing, regardless of its location, will be ready to alert the drivers about the presence of pedestrians intending to cross in conditions of little or none visibility. Thus, since the device is activated turning the flashing LED lighting on, the driver, from a considerable distance, will be able to know that in this pedestrian crossing there are people approaching the road with the intention of crossing, giving him enough time to slow down and stop so that they can cross totally safely.

[0016] Other of the advantages of the device is that the upkeep and maintenance thereof is minimal, since, once installed, it works autonomously, its battery re-

charging automatically thanks to the photovoltaic panel. Furthermore, its implementation cost is much lower than that of a crossing signage through traffic lights, because the installation needs no electric installations nearby neither relies on them and the cost of material and maintenance is minimal.

[0017] It is confirmed, therefore, that the described stand-alone illuminated signalling device for pedestrian crossings represents an innovative structure with structural and constitutive characteristics unknown so far to the end it is intended for, reasons which in combination with its practical utility, provide it with enough basis to obtain the exclusivity privilege which is applied for.

DESCRIPTION OF THE DRAWINGS

[0018] In order to complement the description being fulfilled and with the aim of helping to a better understanding of the characteristics of the invention, the present specification is accompanied, as an integral part thereof, by a set of plans, in which by way of illustration and not of limitation, is represented the following:

Figure number 1.- Shows a perspective view of the schematic representation of a pedestrian crossing wherein has been installed an example of the stand-alone illuminated signalling device for pedestrian crossings object of the invention, being appreciated on it the main elements it comprises as well as the arrangement thereof.

Figure number 2.- Shows a diagram of the electric circuit of an example of the illuminated device, according to the invention.

PREFERENTIAL EMBODIMENT OF THE INVENTION

[0019] In light of the mentioned figures, and according to the numbering taken, it can be seen on them an example of preferred but not limitative embodiment of the stand-alone illuminated signalling device for pedestrian crossings of the invention, whose main parts and elements are described in detail below.

[0020] Thus, as is seen in said figures, the device (1) in question, which preferably is an equipment at 12 Volts DC (Direct current), comprises, essentially, a photovoltaic panel (2) connected to a consumption and load voltage regulator (3) of a battery (4) which feeds the circuit, so that the panel produces the current during the day and the battery storages it during the day so that during the hours of darkness the equipment has current available.

[0021] The device contemplates, furthermore, the incorporation of a twilight cell (5) connected to a general switch (6), so that the device only activates when said cell closes the circuit, at dusk, and leaves it closed during the hours of darkness or when the light conditions are poor.

[0022] Concurrently, the device (1) contemplates the existence of both motion sensors (7) which are installed, for example on posts (8), one on each side of the crossing (9), being said sensors connected to, at least, three relays; one which is a temporized relay with two contacts (R3) and two relays with four contacts (Rl, R2), the number of relays being able to be increased if the installation so requires, in any case connected to, at least, a LED light (10), which will flash and which, just as the motion sensors (7), is installed on one of the posts (8) of both sides of the crossing (9) .

[0023] Thus, at dusk, the twilight cell (5) gives way to current to the motion sensors (7) and, when any of the two motion sensors (7) detects a motion, caused by the presence of people approaching the crossing (9), activates the relay R1 and this one activates the relay R2 and the temporized relay R3. The temporized relay (r3) keeps the flashing signalling LEDs of the light (10) on and, once the programmed connection time ends, the circuit goes back to its stand-by state until a new pedestrian which activates any of the motion sensors (7) appears, so that the process is repeated again.

[0024] As is stated above, the device (1), preferably, works at 12 Volts DC (Direct Current), wherefore the elements it comprises work at said voltage of 12 V DC.

[0025] Being sufficiently described the nature of the present invention, as well as the way to put it into practice, it is not considered necessary to make an extensive description for an expert in the art understands its reach and the derived advantages, stating that, within its essentiality, it might be put in practice in other ways differing in detail from such indicated by way of example, to which the protection requested will also reach, provided that its main principle is not altered, changed or modified.

Claims

1. STAND-ALONE ILLUMINATED SIGNALLING DEVICE FOR PEDESTRIAN CROSSINGS, comprising a photovoltaic panel (2) connected to a consumption and load voltage regulator (3) of a battery (4) which feeds the circuit; a plurality of motion sensors (7) installed on posts (8) one on each side of the crossing (9) and connected to a LED light (10) which flashes and installed on one of the posts (8) on both sides of the crossing (9); **characterized in that** it comprises a twilight cell (5) connected to a general switch (6) so that the device is only activated when said cell (5) closes the circuit when light conditions are poorer than those which are normal or predetermined as sufficient.

2. STAND-ALONE ILLUMINATED SIGNALLING DEVICE FOR PEDESTRIAN CROSSINGS, according to claim 1, **characterized in that** the motion sensors (7) are connected to, at least, three relays; one temporized (R3) and two contact (Rl, R2) relays, connected to the LED light (10) so that said light flashes

for a programmed period of time.

3. STAND-ALONE ILLUMINATED SIGNALLING DEVICE FOR PEDESTRIAN CROSSINGS, according to any of claims 1-2, **characterized in that** all elements it comprises work and are fed at 12 V DC.

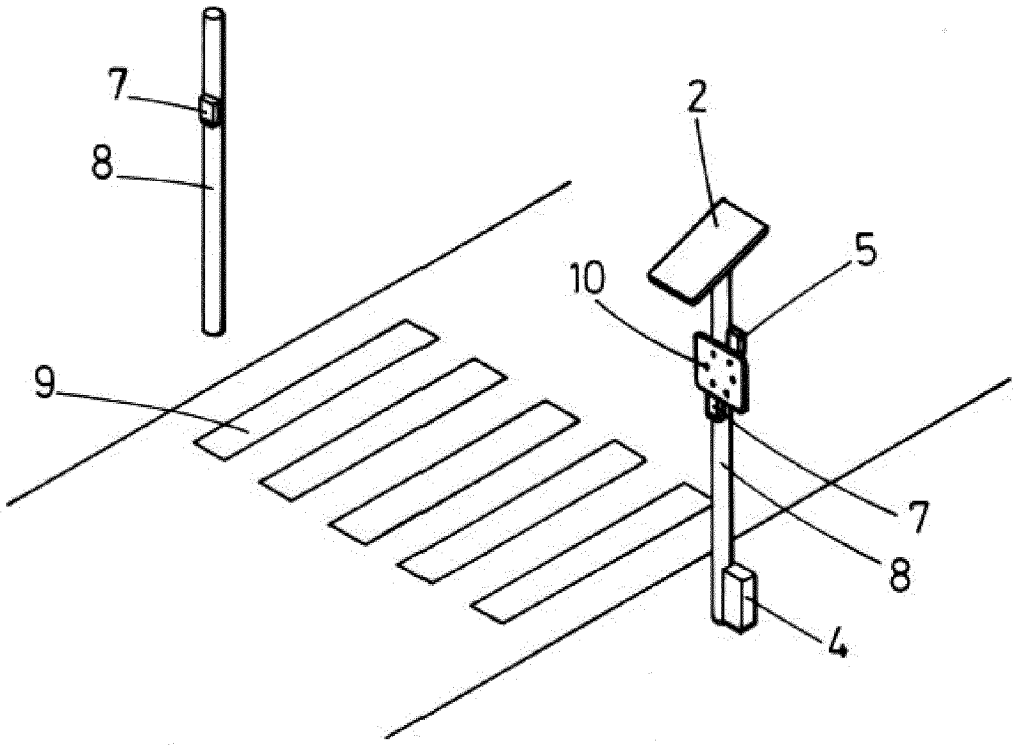

FIG.1

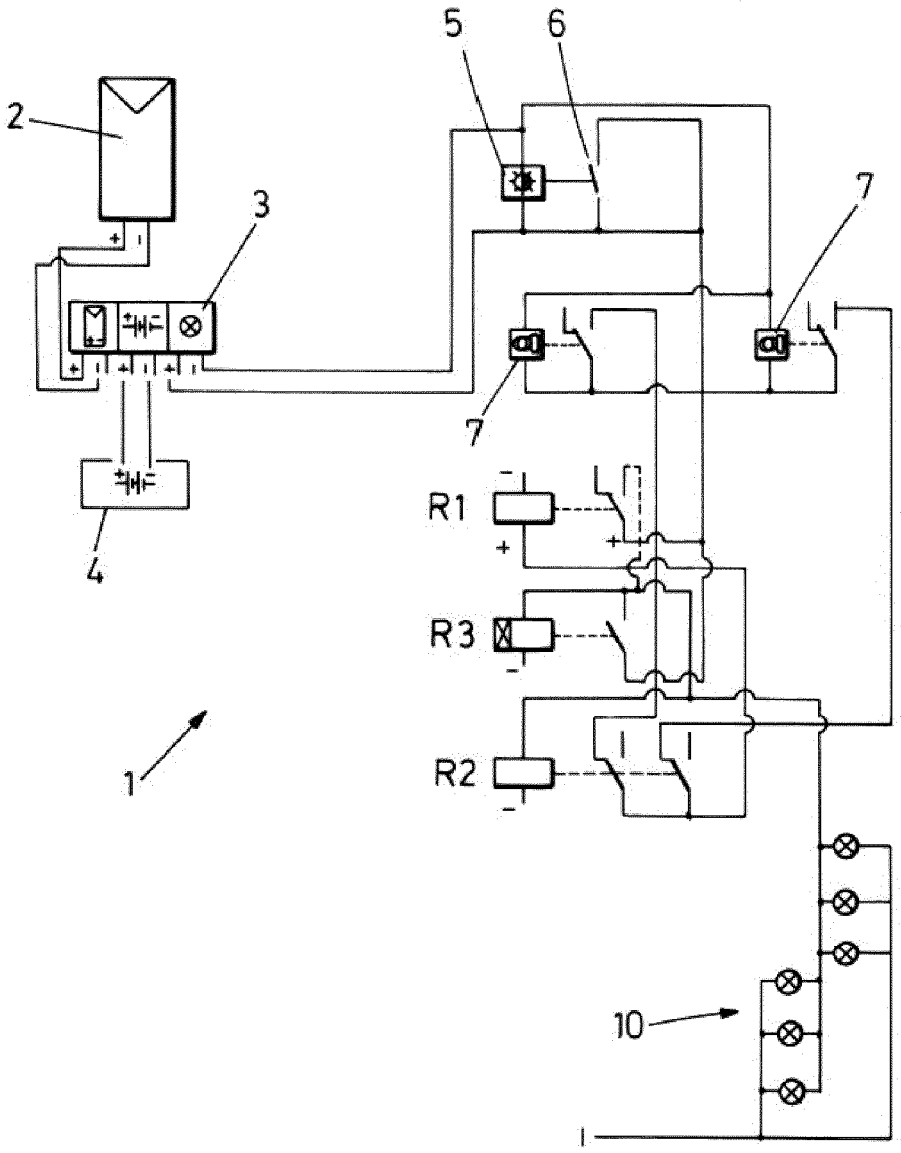

FIG.2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/070101

A. CLASSIFICATION OF SUBJECT MATTER

G08G1/005 (2006.01)
H01H35/00 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G08G, H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES,WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2001338778 A (MATSUSHITA ELECTRIC WORKS LTD) 07/12/2001, abstract; figures. Extraída from base of datoa EPODOC in EPOQUE	1-3
A	FR 2584517 A1 (EQUINOXE PRODUCTION) 09/01/1987, page 4, line 1 - page 8, line 34; figures.	1-3
A	WO 2011110720 A1 (BRUQUET ALVAREZ AMANCIO) 15/09/2011, page 3, line 32 - page 6, line 2; figures.	1-3
A	WO 2007143680 A2 (JONES RICHARD D) 13/12/2007, page 4, line 21 - page 9, line 21; figures.	1-3

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance.
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure use, exhibition, or other means.
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents , such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15/05/2014	**(16/05/2014)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer P. Pérez Fernández Telephone No. 91 3495496

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/070101

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012319868 A1 (KUPCZYN) 20-12-2012, paragraphs[0013 - 0017]; figures.	1-3

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2014/070101

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