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

(11) **EP 2 392 733 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.12.2011 Bulletin 2011/49

(51) Int Cl.:
E01F 9/00 *(2006.01)*

(21) Application number: **10009671.8**

(22) Date of filing: **16.09.2010**

(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 SE SI SK SM TR
Designated Extension States:
BA ME RS

(71) Applicant: **Centrum dopravniho vyzkumu, v.v.i.**
636 00 BRNO (CZ)

(72) Inventors:
- **Pospisil, Karel**
  616 00 BRNO (CZ)
- **Fric, Jindrich**
  664 52 SOKOLNICE (CZ)

(74) Representative: **Malusek, Jiri**
Kania, Sedlak, Smola
Mendlovo namesti 1 a
603 00 Brno (CZ)

(54) **Active guiding system of illuminating signs**

(57) Active guiding system of illuminating signs which contains at least one group comprising one light sensor (2) comprising a reflector and at least one illuminating unit (4) comprising a reflector, whereas the light sensor (2) and the illuminating unit (4) are connected by an optical cable (3). Light sensors (2) are arranged alternatively with illuminating units (4) of another group.

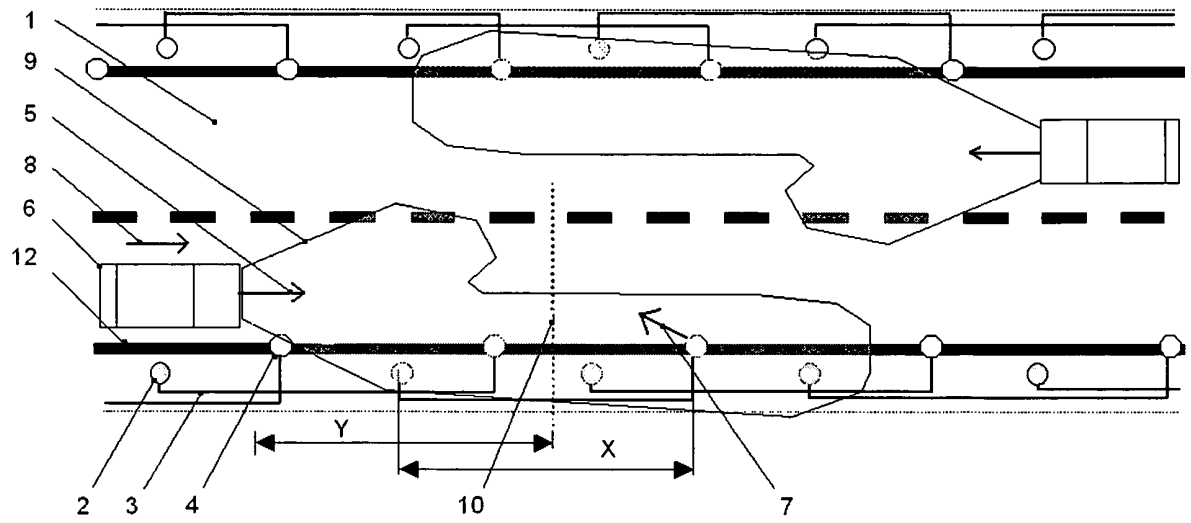

Fig. 1

EP 2 392 733 A1

Description

Background of the Invention

[0001] The invention concerns the active guiding system of illuminating signs.

State of the art

[0002] Plenty of car accidents happen due to a bad range of visibility especially in the time of foggy weather or strong rain, when it is very important to know the direction of the roadway as well as it is very important to evaluate safe speed. Both of those demands depend on the driver's abilities in that situation called as "white darkness". An extremely low speed of the car is a danger due to a possibility of the crash occasioned by another car moving behind, on the other hand in case of a hight speed there is a danger of the crash or of a collision with a balk in the front.

[0003] At the present time the situation mentioned above is solved by front and back fog lights on cars which are not able to transport enough light throught a fog wall to anable to the driver the sufficient overlook for driving. Fog lights are situated near to the road surface because the fog is thinnest along the surface of the road. Nevertheless the overlook is still not sufficient and a part of the reflection light fended back from the fog wall lowers the contrast of the landscape. Additional problem is the danger to be dazzled by oncoming car because its fog lights are brighter than common head lights.

[0004] A second solution of said problem is to provide reflex warning markers for non-motorized membersof the traffic, e.g. pedestrians, guard stones, signaling panels, bollards etc. However these markers have reflexing function only for the distance of their emision distance. In the case of foggy weather is that distance just few meters and this is not enough for the safe traffic.

[0005] The aim of the present invention is to disclose a new kind of guiding systém of illuminating signs which is able to increase the safe factor of the traffic and to ensure the overlook of the driver about the direction and about the space in front of the car.

Feature of the Invention

[0006] The above mentioned disadvantages are considerably eliminated by use of the active leader system of luminary sign *according to the characterizing part of the claim 1.*

[0007] In an advantageous embodiment light sensors are arranged alternatively with illuminating units of another group.

[0008] In another advantageous embodiment both light sensors and illuminating units are adapted for light reception and emitting, so the system includes illumination of the light even behind the vehicle which is activated by.

[0009] In another advantageous embodiment light sensors are arranged along the side of the roadway in crash bariers, guard stones, signaling panels, bollards etc.

[0010] In another advantageous embodiment illuminating units are arranged on the surface of the roadway on a guide line as well as on a highway on the centre line between two traffic lines.

Description of the Drawings

[0011] The invention will be further explained by using drawings, in which Fig. 1 is a schematic view from above on the roadway provided with the active guiding system of illuminating signs according to the invention and Fig. 2 is a detailed disposition scheme of active guiding system of illuminating signs according to the invention.

Preferred Embodiments of the Invention

[0012] As illustrated in Figure 1, the active guiding system of illuminating signs consists of light sensor 2, an optical cable 3 and an illuminating unit 4. The light sensor 2 is placed in crash barriers, markers or another subjects beside a roadway 1. A beam of light 5 generated by headlight of a vehicle 6 is received by reflector placed in a body of the light sensor 2 and is sent throught the optical cable 3 to the illuminating unit 4 in a distance X from the light sensor 2. The optical cable 3 is placed for example under the surface of the roadway 1. A beam of light 7 is flashed back towards the vehicle 6 by reflector placed in the illuminating unit 4. A direction of that beam of light 7 is shown in the Figure 1 by arrow 8. The above mentioned beam of light 7 guides the driver in a correct direction and helps him to keep a suitable speed for safe ride. A shape of a spotlight 9 is generated by headlights of the vehicle 6 as it is presented in Figure 1.

[0013] The distance X between the light sensor 2 and the illuminating unit 4 is selected according to expected speed and the complex overlook in the specific section of the roadway 1. The distance Y is the distance of the drivers outlook limited by fog wall 10, so it is a distance where the driver is able to see. Becauce the illuminating unit 4 is iluminated due to the illumination of light sensor 2 that distance Y is boldly elongated.

[0014] Figure 2 presents the disposition scheme of the basic group of the active guiding system of illuminating signs according to the present invention. A part of the light generated by headlight, illustrated as the spotlight 9, is absorbed by the light sensor 2 and consequently sent throught the optical fiber 3 to the illuminating unit 4. The returned beam of light 7 generated by illuminating unit 4 is making visible that part of the roadway 1 which is generally covered by fog wall 10 in front of the vehicle 6. As the vehicle 6 is coming closer to the illuminating unit 4 the spotlight 9 is absorbed by another light sensor 2 connected with another illuminating unit 4. The whole system is consequently constructed by periodically re-

peated groups which contain the light sensor 2, the optical fiber 3 and the illuminating unit 4. It is advantageous when light sensors 2 change themselves with illuminating units 4 of the other group.

Illuminating units 4, known as a "cat's eyes", are placed on the surface of the roadway 1 for example on a guide line 12 as well as on the highway centre line between two traffic lines.

[0015] Result of said invention is the increasing directional and speed sensation of the driver not only for foggy weather and strong rain but for a night traffic operation too. The car can be helpfull to another drivers behind him too because said system can works in both directions. The illuminating unit 4 is able to sent the beam of light 5 from headlights of the vehicle 6 throught the optical fiber 3 to the light sensor 2 which is able to flash it in the same way as well as the illuminating unit 4. Both light sensors 2 and illuminating units 4 are adapted for light reception and emitting, so the system includes illumination of the light even behind the vehicle 6 which is activated by.

Claims

1. Active guiding system of illuminating signs **characterized in that** it contains at least one group comprising one light sensor (2) comprising a reflector and at least one illuminating unit (4) comprising a reflector, whereas the light sensor (2) and the illuminating unit (4) are connected by an optical cable (3).

2. Active guiding system according to the claim 1, **characterized in that** light sensors (2) are arranged alternatively with illuminating units (4) of another group.

3. Active guiding system according to the claim 1, **characterized in that** both light sensors (2) and illuminating units (4) are adapted for light reception and emitting, so the system includes illumination of the light even behind the vehicle (6) which is activated by.

4. Active guiding system according to the claim 1, **characterized in that** light sensors (2) are arranged along the side of the roadway (1) in crash bariers, guard stones, signaling panels, bollards etc.

5. Active guiding system according to the claim 1, **characterized in that** illuminating units (4) are arranged on the surface of the roadway (1) on a guide line (12) as well as on a highway on the centre line between two traffic lines.

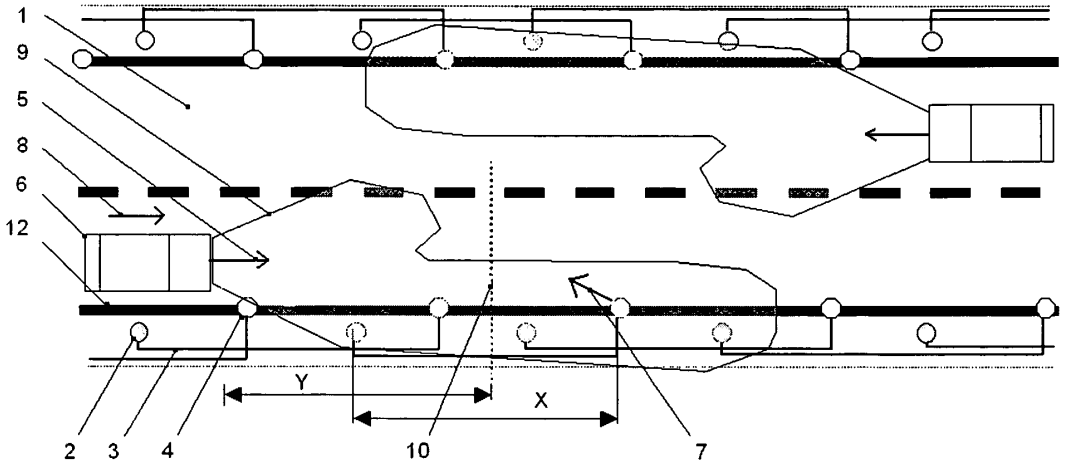

Fig. 1

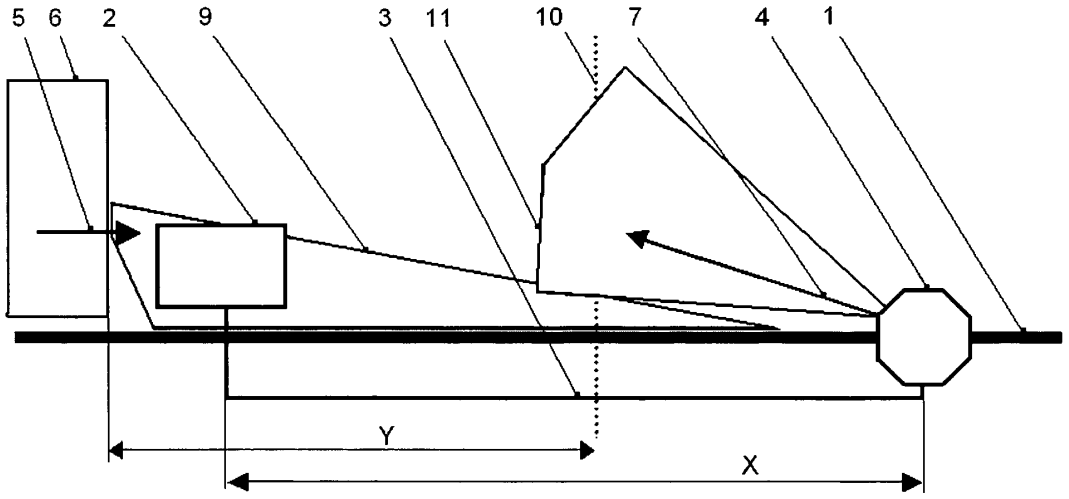

Fig. 2

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 00 9671

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	WO 88/07560 A1 (SECRETARY TRANSPORT BRIT [GB]) 6 October 1988 (1988-10-06) * the whole document *	1-3,5 4	INV. E01F9/00
Y	WO 00/44990 A1 (KIM SUG BAE [KR]) 3 August 2000 (2000-08-03) * page 6, lines 9-20; figures 1-4,8-10 *	4	
X	GB 2 255 431 A (BARRASS MARTIN JOHN) 4 November 1992 (1992-11-04) * page 3, line 15 - page 5, line 22; figures 1-4 *	1,3,5	
X	NL 8 802 322 A (RANZIJN FREDERIQUE LOKHORST V) 17 April 1990 (1990-04-17) * page 4, lines 16-23; figures 1-4 *	1,3,5	
			TECHNICAL FIELDS SEARCHED (IPC) E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 February 2011	Flores Hokkanen, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 9671

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-02-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 8807560 A1	06-10-1988	NONE	
WO 0044990 A1	03-08-2000	CA 2360076 A1	03-08-2000
		DE 10083911 T5	16-09-2004
		GB 2362911 A	05-12-2001
		JP 2002535526 T	22-10-2002
		US 6637973 B1	28-10-2003
GB 2255431 A	04-11-1992	NONE	
NL 8802322 A	17-04-1990	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82