US006888120B2

(12) **United States Patent**
Chiasson et al.

(10) **Patent No.: US 6,888,120 B2**
(45) **Date of Patent: May 3, 2005**

(54) **SUNLOAD SENSOR FOR AUTOMOTIVE VEHICLES**

(75) Inventors: **Michel Chiasson**, Lasalle (CA); **Euan Davidson**, Ulverston (GB); **Jean Lacoursière**, Cap-Rouge (CA); **Simon Thibault**, Sainte-Foy (CA); **Theodore Petrea**, Montreal (CA)

(73) Assignee: **Silonex Inc.**, Montreal (CA)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/159,979**

(22) Filed: **May 29, 2002**

(65) **Prior Publication Data**

US 2003/0001074 A1 Jan. 2, 2003

Related U.S. Application Data

(60) Provisional application No. 60/293,521, filed on May 29, 2001.

(30) **Foreign Application Priority Data**

May 29, 2001 (CA) 2349093

(51) **Int. Cl.**[7] **G01C 21/02**; G01C 21/24; G01J 1/20

(52) **U.S. Cl.** **250/203.4**; 250/239

(58) **Field of Search** ..... 250/203.4, 206.1, 250/206.2, 227.11, 239, 216, 574, 214 AL; 236/91 C, DIG. 15; 126/573, 578; 340/600, 425.5, 884; 356/222, 139.01; 165/43, 41; 454/75, 156, 900

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,367,403	A	* 1/1983	Miller	250/203.4
4,491,727	A	1/1985	Appelbaum et al.	250/203 R
4,710,618	A	12/1987	Matsumoto et al.	250/203 R
4,890,460	A	1/1990	Takasi et al.	62/180
5,117,744	A	6/1992	Zimmer et al.	454/75
5,153,429	A	10/1992	Takahashi	250/239
5,181,654	A	1/1993	Yoshimi et al.	236/91 C
5,337,802	A	8/1994	Kajino et al.	165/22
5,454,794	A	* 10/1995	Narciso et al.	607/88
5,547,125	A	8/1996	Hennessee et al.	236/49.3
5,553,775	A	9/1996	Kato et al.	
5,670,774	A	9/1997	Hill	250/203.4
5,810,078	A	9/1998	Knutsson et al.	165/203
5,957,375	A	* 9/1999	West	236/91 C
5,979,779	A	11/1999	Asai et al.	236/49.3
6,018,165	A	1/2000	Kerkmann et al.	250/574
6,084,228	A	7/2000	Hill et al.	250/203.4
6,087,650	A	7/2000	Dage	250/214 AL
6,107,630	A	8/2000	Mazurowski et al.	250/338.4
6,185,950	B1	2/2001	Baruschke et al.	62/244
6,202,934	B1	3/2001	Kamiya et al.	236/91 C
6,297,740	B1	* 10/2001	Hill et al.	340/600

FOREIGN PATENT DOCUMENTS

EP	0350866	1/1990
WO	WO 9423277	10/1994
WO	WO-99/24951 A1	5/1999

* cited by examiner

Primary Examiner—Thanh X. Luu
Assistant Examiner—Seung C. Sohn
(74) *Attorney, Agent, or Firm*—Darby & Darby

(57) **ABSTRACT**

A dual-channel sunload sensor capable of sensing the intensity and directionality of the solar radiative power entering the cabin of a car through the windshield, for the purpose of providing information to the data processing system of the car that enables a control of the air conditioning system that optimizes the comfort of the driver and of the front passenger. Signals from the sensor offer reliable indications of the solar load power and directionality for a wide range of angular positions of the sun. The sensor includes two convex transparent parts collecting light each toward a respective photodiode, the transparent parts being separated by an opaque portion.

14 Claims, 13 Drawing Sheets