



US007167294B2

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

(10) **Patent No.:** **US 7,167,294 B2**
(45) **Date of Patent:** ***Jan. 23, 2007**

(54) **AUTOMOBILE EXTERIOR SIDEVIEW MIRROR SYSTEM**

(75) Inventors: **Niall R Lynam**, Holland, MI (US);
John O Lindahl, Fruitport, MI (US);
Hahns Y Fuchs, Dorfrozelten (DE)

(73) Assignee: **Donnelly Corporation**, Holland, MI (US)

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

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/817,645**

(22) Filed: **Apr. 2, 2004**

(65) **Prior Publication Data**
US 2004/0190166 A1 Sep. 30, 2004

Related U.S. Application Data
(63) Continuation of application No. 09/745,172, filed on Dec. 20, 2000, now Pat. No. 6,717,712, which is a continuation-in-part of application No. 09/478,315, filed on Jan. 6, 2000, now Pat. No. 6,522,451.

(51) **Int. Cl.**
G02F 1/15 (2006.01)
G02B 5/10 (2006.01)
G02B 7/182 (2006.01)
B60R 1/06 (2006.01)

(52) **U.S. Cl.** **359/265**; 359/841; 359/864; 359/866; 359/868; 359/872; 248/549; 248/900

(58) **Field of Classification Search** 359/841, 359/850, 851, 854, 864, 865, 866, 868, 872, 359/877, 265, 267; 248/549, 900
See application file for complete search history.

(56) **References Cited**
U.S. PATENT DOCUMENTS
2,890,539 A * 6/1959 Holt
3,338,655 A 8/1967 Young
3,375,053 A 3/1968 Ward 350/293
3,389,952 A 6/1968 Tobin, Jr.
4,268,120 A 5/1981 Jitsumori 350/302

(Continued)

FOREIGN PATENT DOCUMENTS

DE 2409748 9/1975

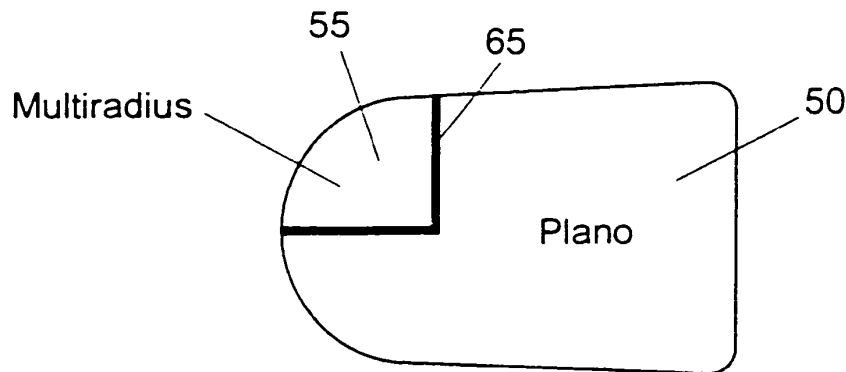
(Continued)

Primary Examiner—Ricky D. Shafer
(74) *Attorney, Agent, or Firm*—Van Dyke, Gardner, Linn & Burkhardt, LLP

(57) **ABSTRACT**

An automobile exterior sideview mirror system includes an exterior sideview mirror assembly, which includes a reflective element assembly. The reflective element assembly includes a first reflective element having a unit magnification and a second reflective element having a curvature. The first reflective element and the second reflective element are supported at a support element. The mirror system preferably further includes an actuator, which is operable to adjust the orientation of the reflective element assembly. The second reflective element is disposed adjacent to and separate from the first reflective element when it is included in the exterior sideview mirror assembly. Further, a demarcation element is provided between the first reflective element and the second reflective element. A portion of the second reflective element adjacent the demarcation element has a front surface that is generally coplanar with the front surface of the first reflective element.

58 Claims, 13 Drawing Sheets



US 7,167,294 B2

Page 2

U.S. PATENT DOCUMENTS

4,306,770	A *	12/1981	Marhauer	.....	359/864	5,805,367	A	9/1998	Kanazawa		
4,449,786	A	5/1984	McCord	.....	350/293	5,910,854	A	6/1999	Varaprasad et al.	.....	359/273
4,555,166	A *	11/1985	Enomoto	.....	359/874	6,116,743	A	9/2000	Hoek		
4,678,294	A	7/1987	Van Nostrand			6,154,306	A	11/2000	Varaprasad et al.	.....	359/273
4,727,302	A *	2/1988	Mizuta et al.	.....	318/567	6,511,192	B1	1/2003	Henion et al.		
4,859,046	A *	8/1989	Traynor et al.	.....	359/866	6,522,451	B1	2/2003	Lynam		
4,917,485	A	4/1990	Baldwin, Sr.			6,717,712	B1 *	4/2004	Lynam et al.	.....	359/265
5,005,962	A *	4/1991	Edelman	.....	359/864						
5,239,405	A	8/1993	Varaprasad et al.	.....	359/272						
5,412,512	A	5/1995	Zebold et al.								
5,550,677	A	8/1996	Schofield et al.	.....	359/604						
5,557,467	A	9/1996	McColgan et al.								
5,621,577	A	4/1997	Lang et al.								
5,668,663	A	9/1997	Varaprasad et al.	.....	359/608						
5,724,187	A	3/1998	Varaprasad et al.	.....	359/608						
5,751,489	A	5/1998	Caskey et al.	.....	359/603						
5,784,211	A	7/1998	Mingledorff								
5,793,542	A	8/1998	Kondo et al.								

FOREIGN PATENT DOCUMENTS

DE	3620228	12/1987
DE	4026578	4/1992
EP	0310261 A1	9/1988
EP	0729864	9/1996
EP	0917987	5/1999
FR	2628042	9/1929
GB	2092543	8/1982
JP	1186443	7/1989

* cited by examiner

10

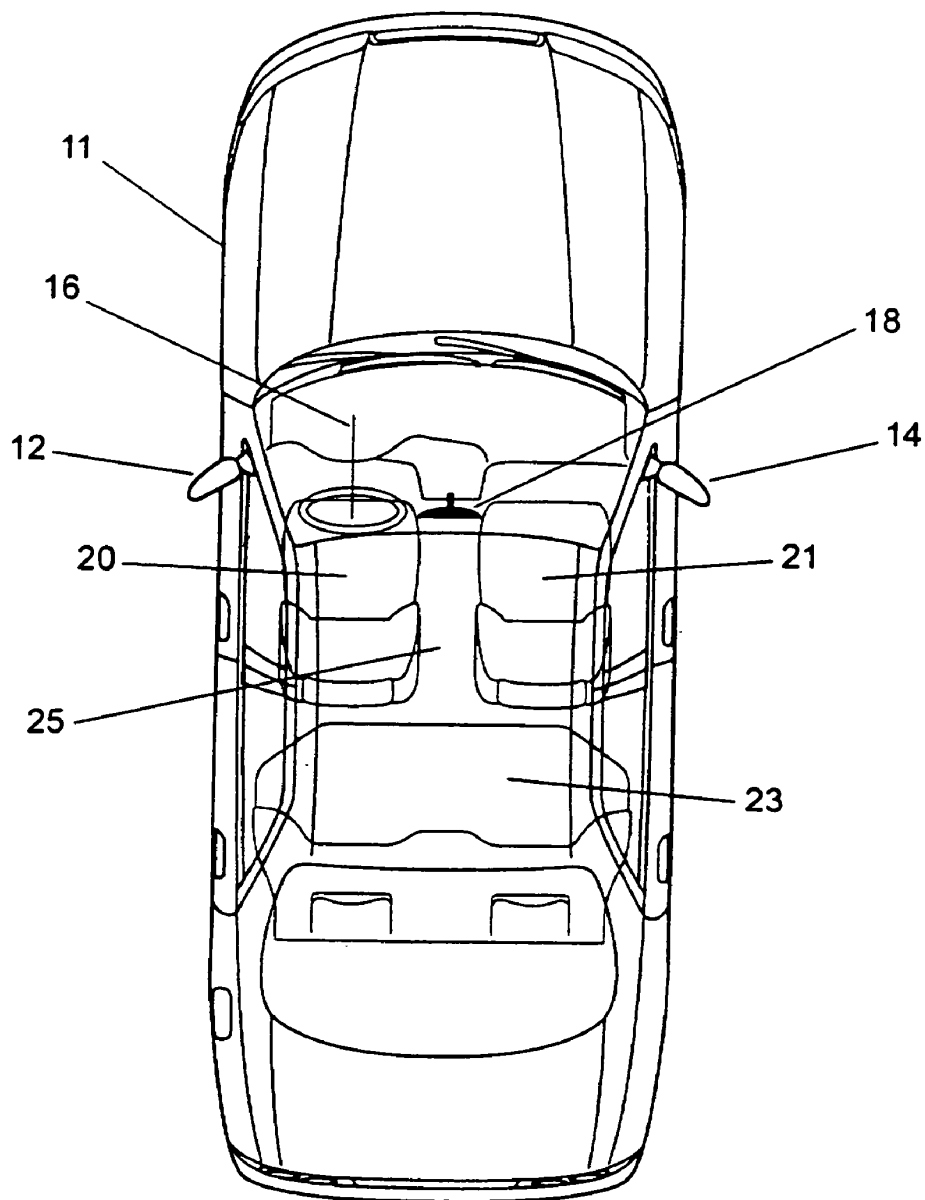


Figure 1

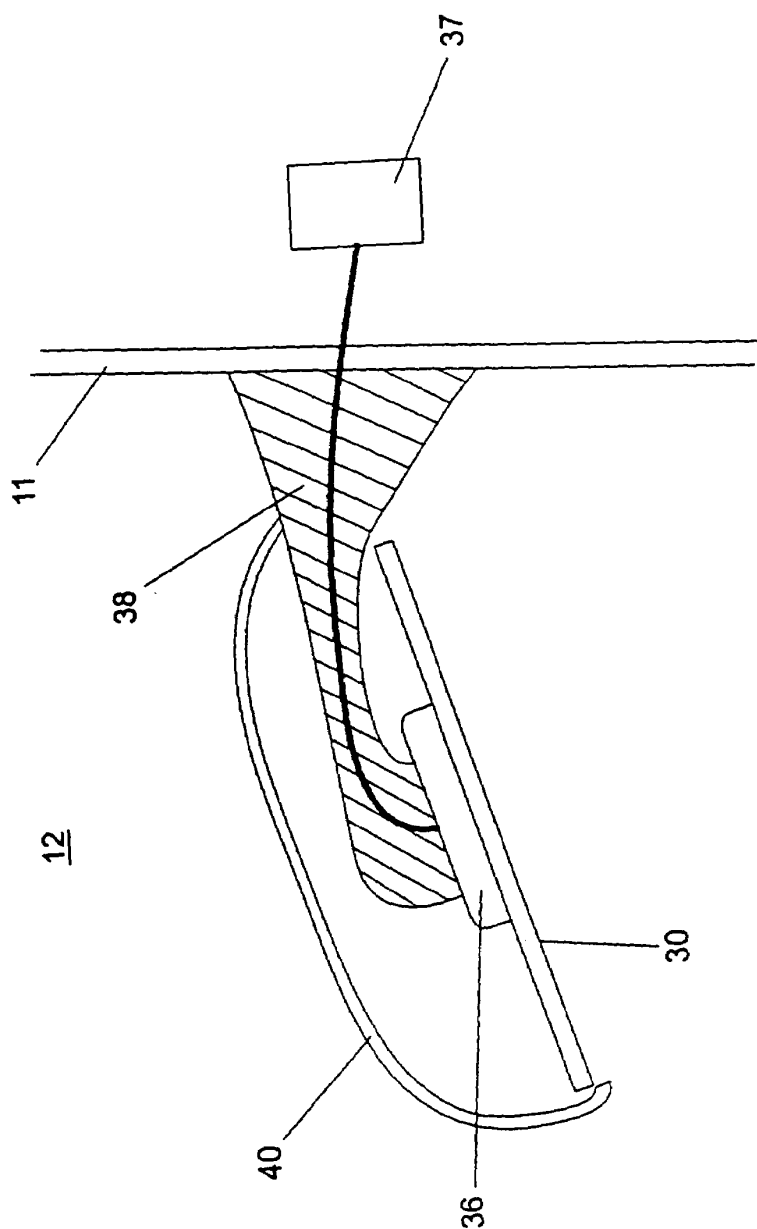


Figure 2

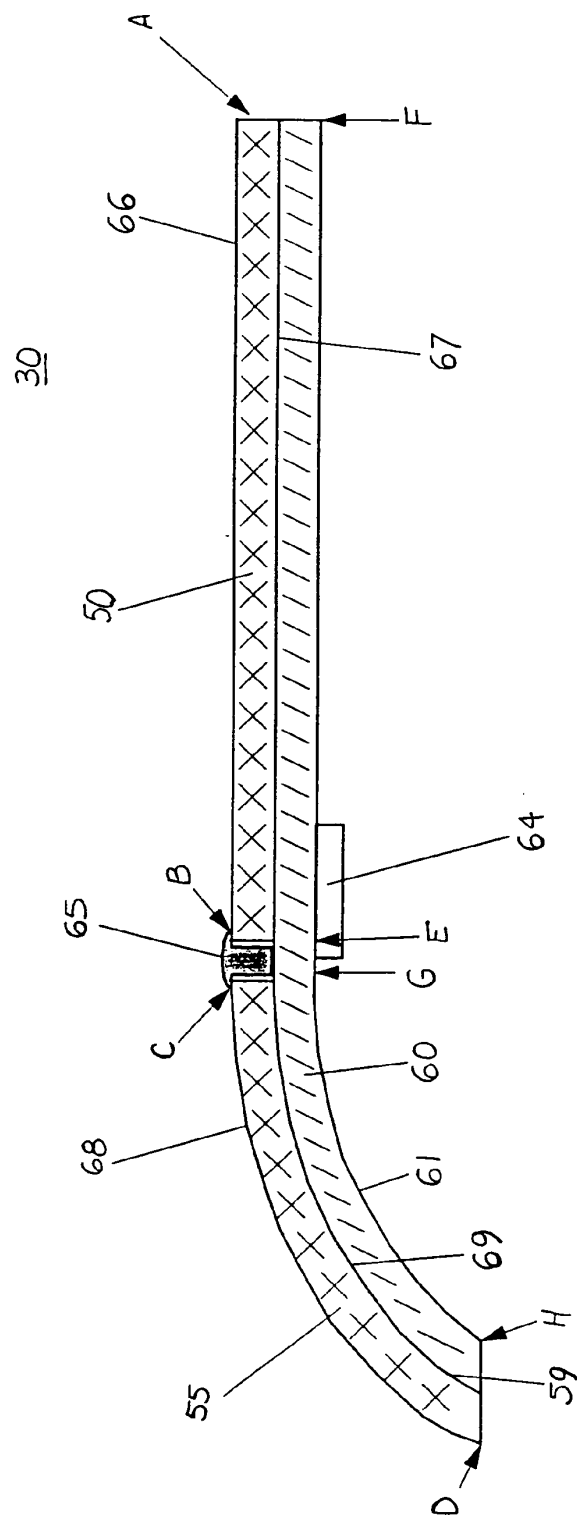


Figure 3

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.