



US006717712B2

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

(10) **Patent No.:** **US 6,717,712 B2**
(45) **Date of Patent:** **Apr. 6, 2004**

(54) **EXTERIOR MIRROR PLANO-AUXILIARY REFLECTIVE ELEMENT ASSEMBLY**

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

(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 84 days.

(21) Appl. No.: **09/745,172**

(22) Filed: **Dec. 20, 2000**

(65) **Prior Publication Data**

US 2002/0072026 A1 Jun. 13, 2002

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/478,315, filed on Jan. 6, 2000, now Pat. No. 6,522,451.

(51) **Int. Cl.**⁷ **G02F 1/15**; G02B 5/08; G02B 5/10; G02B 7/182; B60R 1/06

(52) **U.S. Cl.** **359/265**; 359/267; 359/841; 359/850; 359/864; 359/866; 359/868; 359/872; 359/877; 248/549; 248/900

(58) **Field of Search** 359/841, 850, 359/851, 854, 855, 864, 865, 866, 868, 872, 877, 265, 267; 248/549, 900

(56) **References Cited**

U.S. PATENT DOCUMENTS

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
4,449,786 A		5/1984	McCord	350/293
4,678,294 A	*	7/1987	Van Nostrand	
4,917,485 A	*	4/1990	Baldwin, Sr.	
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.	
5,805,367 A	*	9/1998	Kanazawa	
5,910,854 A		6/1999	Varaprasad et al.	359/273
6,116,743 A	*	9/2000	Hoek	
6,154,306 A		11/2000	Varaprasad et al.	359/273
6,511,192 B1	*	1/2003	Henion et al.	
6,522,451 B1	*	2/2003	Lynam	

FOREIGN PATENT DOCUMENTS

DE	2409748	9/1975	B60R/1/02
DE	3620228	* 12/1987		
DE	4026578	* 4/1992		
EP	0310261 A1	9/1988	B60R/1/08
EP	0729864	* 9/1996		
EP	0917987	* 5/1999		
FR	2628042	9/1929	B60R/1/06
GB	2092534	* 8/1982		
JP	1186443	7/1989	B60R/1/06

* cited by examiner

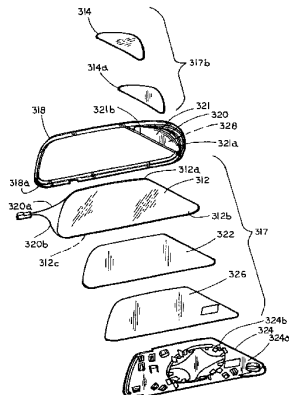
Primary Examiner—Ricky D. Shafer

(74) *Attorney, Agent, or Firm*—Van Dyke, Gardner, Linn & Burkhardt, LLP

(57) **ABSTRACT**

This invention provides a reflective element assembly suitable for use in an exterior sideview mirror assembly mounted to the side body of an automobile. The reflective element assembly includes a first reflective element and a second reflective element. The second reflective element is angled downwardly and forwardly with respect to the first reflective element when the mirror assembly is mounted to a side of an automobile to provide an increased field of view. In one form, both reflective elements are commonly supported on a bezel, which is mounted to the mirror assembly casing. In another form, the reflective elements are separately mounted, with the second reflective element fixedly mounted to the casing and the first reflective element movably supported in the mirror casing, for example, on an actuator.

54 Claims, 13 Drawing Sheets



10

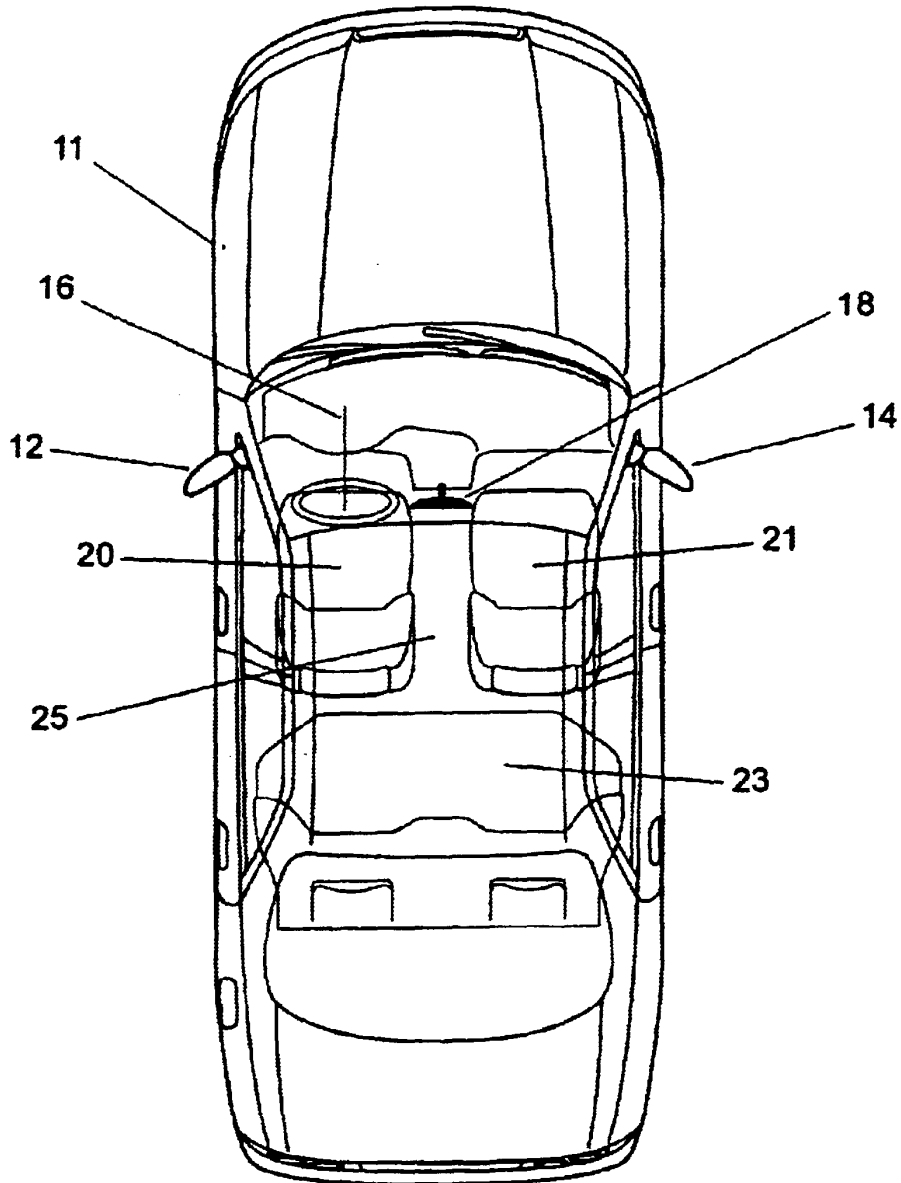


Figure 1

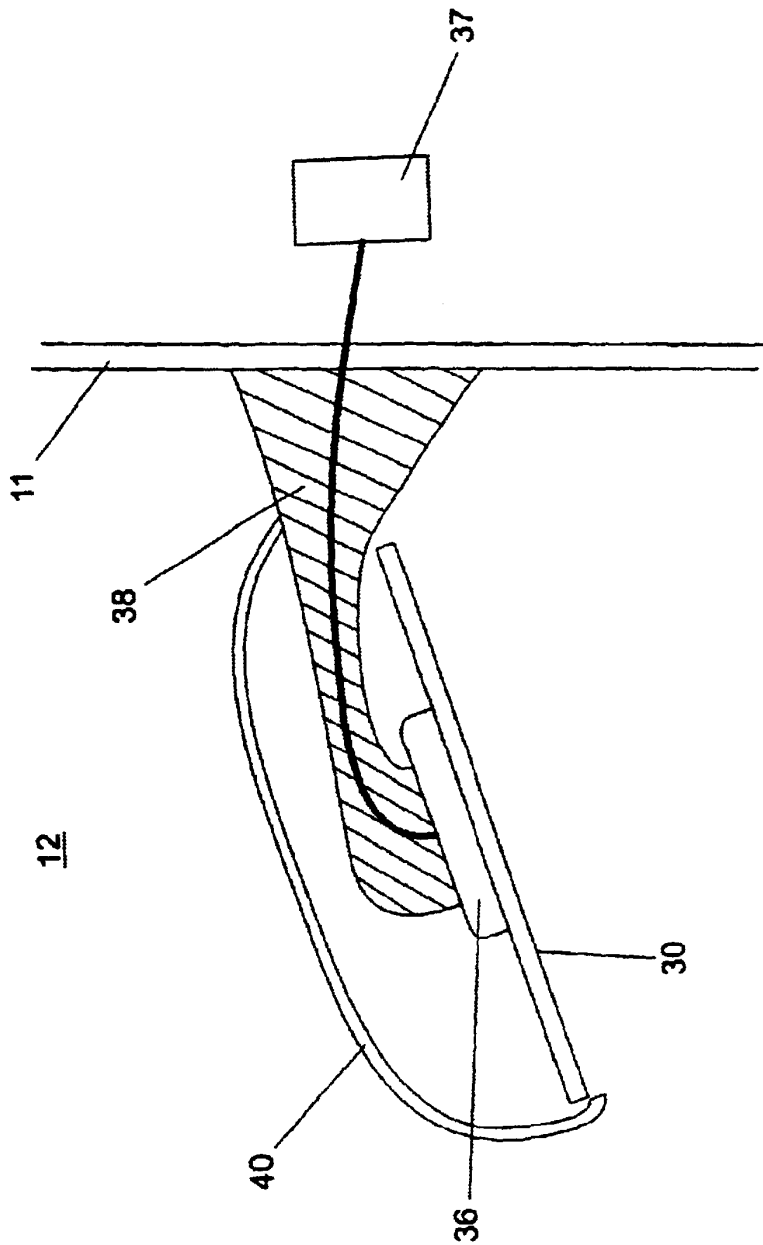


Figure 2

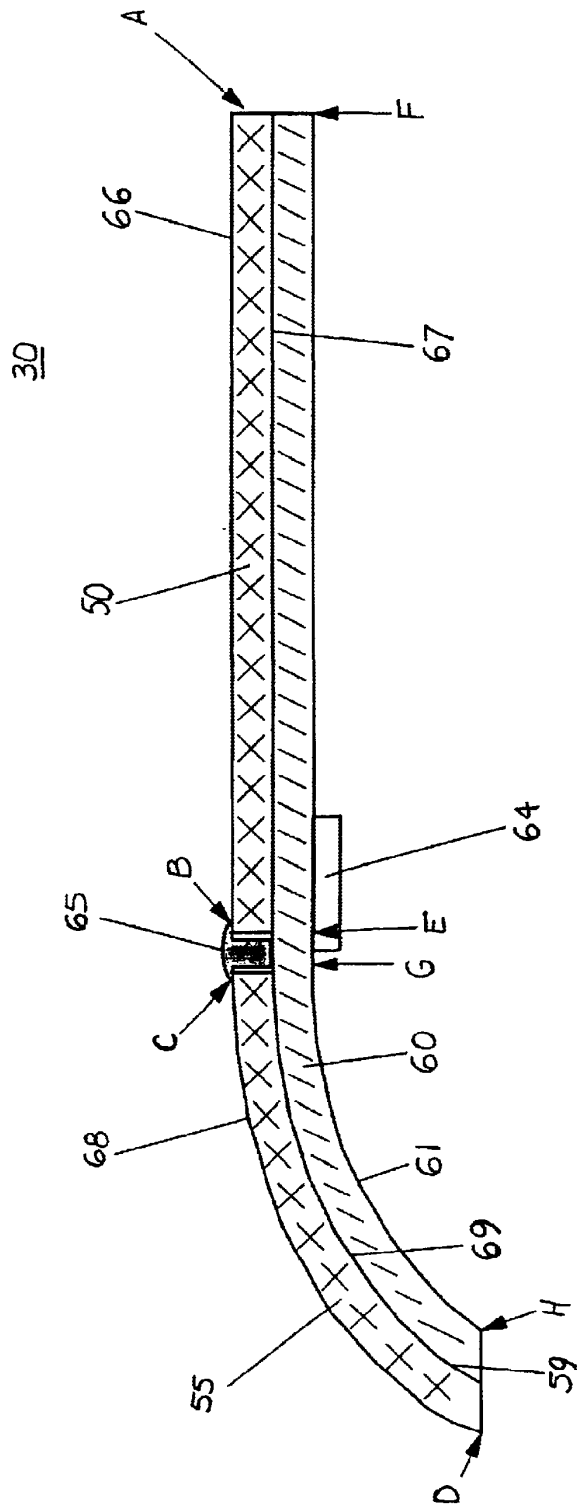


Figure 3

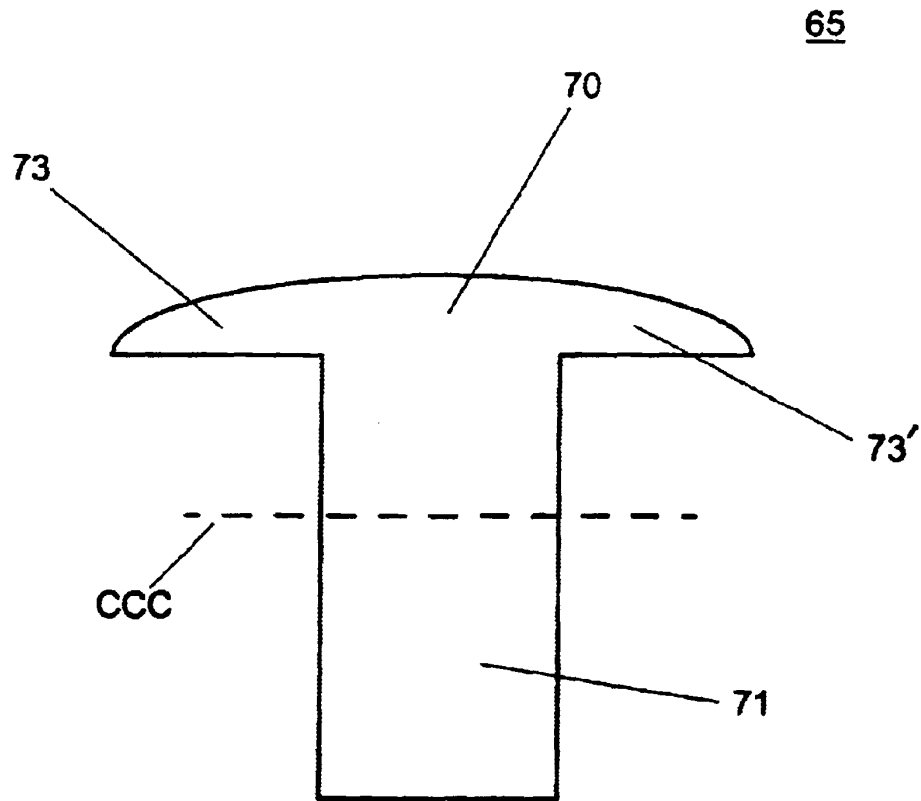


Figure 4

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.