



US007934843B2

(12) **United States Patent**  
**Lynam**

(10) **Patent No.:** **US 7,934,843 B2**  
(45) **Date of Patent:** **\*May 3, 2011**

(54) **EXTERIOR SIDEVIEW MIRROR SYSTEM**

(75) Inventor: **Niall R. Lynam**, 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 0 days.

This patent is subject to a terminal disclaimer.

RE17,274 E	4/1929	Porter
2,135,262 A	11/1938	Schumacher
2,263,382 A	11/1941	Gotzinger
2,514,989 A	7/1950	Buren
2,580,014 A	12/1951	Gazda
2,636,419 A	4/1953	Kerr
2,778,273 A	1/1957	Fellmeth
2,890,539 A	6/1959	Holt
2,911,177 A	11/1959	West
3,104,274 A	9/1963	King
3,131,250 A	4/1964	Ely
3,146,296 A	8/1964	Fischer
3,170,985 A	2/1965	Katulich
3,175,463 A	3/1965	Seashore

(Continued)

(21) Appl. No.: **12/851,045**

(22) Filed: **Aug. 5, 2010**

(65) **Prior Publication Data**

US 2010/0296187 A1 Nov. 25, 2010

**Related U.S. Application Data**

(60) Continuation of application No. 12/197,666, filed on Aug. 25, 2008, now Pat. No. 7,842,154, which is a division of application No. 10/709,434, filed on May 5, 2004, now Pat. No. 7,420,756.

(60) Provisional application No. 60/471,872, filed on May 20, 2003.

(51) **Int. Cl.**

**G02B 5/08** (2006.01)  
**G02B 7/182** (2006.01)

(52) **U.S. Cl.** ..... **359/866; 359/877**

(58) **Field of Classification Search** ..... **359/866, 359/872, 877, 883**

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

1,114,559 A 10/1914 Weed  
1,672,559 A 6/1928 Doble

**FOREIGN PATENT DOCUMENTS**

DE 2409748 9/1975

(Continued)

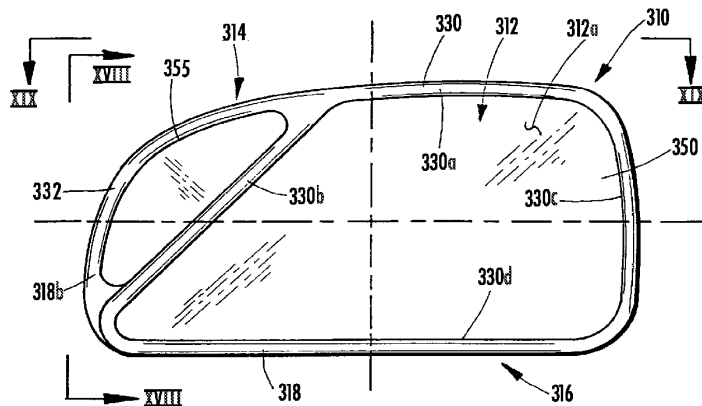
*Primary Examiner* — Alessandro Amari

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

(57) **ABSTRACT**

An exterior sideview mirror system includes an exterior side-view mirror assembly including a plano-auxiliary reflective element having a rearward field of view when attached to a side of an automobile. The plano reflective element and the auxiliary reflective element are mounted adjacently at the reflective element assembly in a side-by-side relationship and not superimposed. The plano reflective element and the auxiliary reflective element are supported at a backing plate element. The rearward field of view of the auxiliary reflective element may be different from and angled to the rearward field of view of the plano reflective element. The plano reflective element and/or the auxiliary reflective element may have one of (a) a glass substrate having a surface coated with a metallic reflector coating and (b) a polymeric substrate having a thin glass element applied to a surface thereof and with an opposing surface thereof having a reflecting layer applied thereto.

**39 Claims, 16 Drawing Sheets**



## U.S. PATENT DOCUMENTS

3,266,016 A	8/1966	Maruyama et al.	4,906,075 A	3/1990	Majsumiya
3,267,806 A	8/1966	Azegami	4,906,085 A	3/1990	Sugihara et al.
3,280,701 A	10/1966	Donnelly et al.	4,913,542 A	4/1990	Adolfsson
3,337,285 A	8/1967	Travis	4,917,485 A	4/1990	Baldwin, Sr.
3,338,655 A	8/1967	Young	4,929,074 A	5/1990	Urban
3,375,053 A	3/1968	Ward	4,932,769 A	6/1990	Goosen
3,389,952 A	6/1968	Tobin, Jr.	4,932,770 A	6/1990	Caravaty
3,404,935 A	10/1968	Creager	4,944,581 A	7/1990	Ichikawa
3,408,136 A	10/1968	Travis	4,948,242 A	8/1990	Desmond et al.
3,424,517 A	1/1969	Budreck	4,989,964 A	2/1991	Meise
3,563,638 A	2/1971	Panozzo	5,005,962 A	4/1991	Edelman
3,601,614 A	8/1971	Platzer, Jr.	5,014,167 A	5/1991	Roberts
3,610,739 A	10/1971	Seashore	5,022,747 A	6/1991	Polanyi et al.
3,667,833 A	6/1972	Baldwin, Sr.	5,033,835 A	7/1991	Platzer, Jr.
3,708,222 A	1/1973	Stern	5,044,739 A	9/1991	do Espirito Santo
3,759,647 A	9/1973	Schrenk et al.	5,050,977 A	9/1991	Platzer, Jr.
3,764,201 A	10/1973	Haile	5,052,792 A	10/1991	McDonough
3,773,882 A	11/1973	Schrenk	5,066,112 A	11/1991	Lynam et al.
3,806,232 A	4/1974	Gray	5,073,012 A	12/1991	Lynam
3,826,563 A	7/1974	Davis	5,076,673 A	12/1991	Lynam et al.
3,881,811 A	5/1975	French	5,078,480 A	1/1992	Warszawski
3,884,606 A	5/1975	Schrenk	5,080,492 A	1/1992	Platzer, Jr.
3,909,117 A	9/1975	Takahashi et al.	5,085,907 A	2/1992	Smith
4,193,668 A	3/1980	Skinner	5,107,374 A	4/1992	Lupo et al.
4,200,359 A	4/1980	Lawson	5,115,346 A	5/1992	Lynam
4,223,983 A	9/1980	Bloom	5,115,352 A	5/1992	do Espirito Santo
4,258,979 A	3/1981	Mahin	5,117,346 A	5/1992	Gard
4,264,144 A	4/1981	McCord	5,118,540 A	6/1992	Hutchison
4,268,120 A	5/1981	Jitsumori	5,140,455 A	8/1992	Varaprasad et al.
4,281,899 A	8/1981	Oskam	5,142,407 A	8/1992	Varaprasad et al.
4,293,191 A	10/1981	Kim	5,151,816 A	9/1992	Varaprasad et al.
4,303,308 A	12/1981	Kobrin	5,151,824 A	9/1992	O'Farrell
4,306,770 A	12/1981	Marhauer	5,166,833 A	11/1992	Shyu
4,311,362 A	1/1982	LaPorte	5,178,448 A	1/1993	Adams et al.
4,311,363 A	1/1982	Marsalka et al.	5,179,471 A	1/1993	Caskey et al.
4,325,609 A	4/1982	Alford	5,183,099 A	2/1993	Bechu
4,331,382 A	5/1982	Graff	5,189,537 A	2/1993	O'Farrell
4,350,412 A	9/1982	Steenblik et al.	5,193,029 A	3/1993	Schofield et al.
4,385,804 A	5/1983	Tamura et al.	5,207,492 A	5/1993	Roberts
4,435,042 A	3/1984	Wood et al.	5,225,943 A	7/1993	Lupo
4,436,371 A	3/1984	Wood et al.	5,233,461 A	8/1993	Dorman et al.
4,436,372 A	3/1984	Schmidt et al.	5,237,458 A	8/1993	Polanyi et al.
4,439,013 A	3/1984	Hagn et al.	5,237,459 A	8/1993	Strauss
4,449,786 A	5/1984	McCord	5,239,405 A	8/1993	Varaprasad et al.
4,470,665 A	9/1984	Blom	5,247,395 A	9/1993	Martinez
4,499,451 A	2/1985	Suzuki et al.	5,253,109 A	10/1993	O'Farrell et al.
4,526,446 A	7/1985	Adams	5,262,894 A	11/1993	Wheatley et al.
4,549,786 A	10/1985	Albers et al.	5,285,060 A	2/1994	Larson et al.
4,555,166 A	11/1985	Enomoto	5,295,021 A	3/1994	Swanson
4,575,202 A	3/1986	McGuire	5,296,973 A	3/1994	Burke
4,588,267 A	5/1986	Pastore	5,313,335 A	5/1994	Gray et al.
4,609,266 A	9/1986	Blom	5,327,288 A	7/1994	Wellington et al.
4,623,222 A	11/1986	Itoh et al.	5,354,965 A	10/1994	Lee
4,629,296 A	12/1986	White	5,355,245 A	10/1994	Lynam
4,630,904 A	12/1986	Pastore	5,361,172 A	11/1994	Schissel et al.
4,666,264 A	5/1987	Yamabe	5,371,659 A	12/1994	Pastrick et al.
4,674,849 A	6/1987	Stewart	5,406,414 A	4/1995	O'Farrell et al.
4,674,850 A	6/1987	Blom	5,412,512 A	5/1995	Zebold et al.
4,678,294 A	7/1987	Van Nostrand	5,424,875 A	6/1995	Davis, II
4,679,906 A	7/1987	Brandenburg	5,432,643 A	7/1995	Huang
4,712,879 A	12/1987	Lynam et al.	5,437,931 A	8/1995	Tsai et al.
4,715,701 A	12/1987	Urban	5,446,576 A	8/1995	Lynam et al.
4,721,364 A	1/1988	Itoh et al.	5,481,409 A	1/1996	Roberts
4,727,302 A	2/1988	Mizuta et al.	5,483,386 A	1/1996	Carson
4,733,336 A	3/1988	Skogler et al.	5,497,305 A	3/1996	Pastrick et al.
4,737,188 A	4/1988	Bahls	5,497,306 A	3/1996	Pastrick
4,770,522 A	9/1988	Alten	5,509,606 A	4/1996	Breithaupt et al.
4,773,740 A	9/1988	Kawakami et al.	5,517,367 A	5/1996	Kim et al.
D297,926 S	10/1988	Kesler	5,523,877 A	6/1996	Lynam
4,793,690 A	12/1988	Gahan et al.	5,525,264 A	6/1996	Cronin et al.
4,799,768 A	1/1989	Gahan	5,526,195 A	6/1996	Thomas
4,824,231 A	4/1989	Quintana	5,530,588 A	6/1996	Vivier
4,826,289 A	5/1989	Vandenbrink et al.	5,535,056 A	7/1996	Caskey et al.
4,828,379 A	5/1989	Parsons et al.	5,550,677 A	8/1996	Schofield et al.
4,853,283 A	8/1989	Skolnick	5,557,467 A	9/1996	McColgan et al.
4,859,046 A	8/1989	Traynor et al.	5,559,640 A	9/1996	Vachss et al.
4,882,466 A	11/1989	Friel	5,563,744 A	10/1996	Matsumiya
4,882,565 A	11/1989	Gallmeyer	5,567,360 A	10/1996	Varaprasad et al.
			5,575,552 A	11/1996	Faloon et al.

5,579,133	A	11/1996	Black et al.	6,286,965	B1	9/2001	Caskey et al.
5,587,236	A	12/1996	Agrawal et al.	6,294,989	B1	9/2001	Schofield et al.
5,587,699	A	12/1996	Faloon et al.	6,310,611	B1	10/2001	Caldwell
5,594,222	A	1/1997	Caldwell	6,315,419	B1	11/2001	Platzer, Jr.
5,594,593	A	1/1997	Milner	6,318,870	B1	11/2001	Spooner et al.
5,610,756	A	3/1997	Lynam et al.	6,320,282	B1	11/2001	Caldwell
5,621,569	A	4/1997	Schlenke	6,329,925	B1	12/2001	Skiver et al.
5,621,577	A	4/1997	Lang et al.	6,341,523	B2	1/2002	Lynam
5,644,442	A	7/1997	Lemere	6,343,402	B1	2/2002	Smith et al.
5,649,756	A	7/1997	Adams et al.	6,356,376	B1	3/2002	Tonar et al.
5,668,663	A	9/1997	Varaprasad et al.	6,390,632	B1	5/2002	Palathingal
5,669,698	A	9/1997	Veldman et al.	6,396,397	B1	5/2002	Bos et al.
5,669,699	A	9/1997	Pastrick et al.	6,398,377	B1	6/2002	Chou
5,669,704	A	9/1997	Pastrick	6,409,354	B1	6/2002	Richard
5,669,705	A	9/1997	Pastrick et al.	6,420,036	B1	7/2002	Varaprasad et al.
5,670,935	A	9/1997	Schofield et al.	6,428,172	B1	8/2002	Hutzel et al.
5,689,370	A	11/1997	Tonar et al.	6,441,964	B1	8/2002	Chu et al.
5,691,855	A	11/1997	Lupkas	6,445,287	B1	9/2002	Schofield et al.
5,715,093	A	2/1998	Schierbeek et al.	6,449,082	B1	9/2002	Agrawal et al.
5,722,836	A	3/1998	Younker	6,472,979	B2	10/2002	Schofield et al.
5,724,187	A	3/1998	Varaprasad et al.	6,498,620	B2	12/2002	Schofield et al.
5,751,489	A	5/1998	Caskey et al.	6,501,387	B2	12/2002	Skiver et al.
5,760,962	A	6/1998	Schofield et al.	6,511,192	B1	1/2003	Henion et al.
5,784,211	A	7/1998	Mingledorff	6,512,624	B2	1/2003	Tonar et al.
5,786,772	A	7/1998	Schofield et al.	6,522,451	B1	2/2003	Lynam
5,788,357	A	8/1998	Muth et al.	6,537,138	B2	3/2003	Ohmori et al.
5,790,298	A	8/1998	Tonar	6,582,109	B2	6/2003	Miller
5,790,327	A	8/1998	Lee et al.	6,595,649	B2	7/2003	Hoekstra et al.
5,793,542	A	8/1998	Kondo et al.	6,615,438	B1	9/2003	Franco
5,796,094	A	8/1998	Schofield et al.	6,627,918	B2	9/2003	Getz et al.
5,796,532	A	8/1998	Kanazawa	6,642,851	B2	11/2003	DeLine et al.
5,805,367	A	9/1998	Kanazawa	6,648,477	B2	11/2003	Hutzel et al.
5,808,777	A	9/1998	Lynam et al.	6,669,109	B2	12/2003	Ivanov et al.
5,823,654	A	10/1998	Pastrick et al.	6,690,268	B2	2/2004	Schofield et al.
5,825,527	A	10/1998	Forgette et al.	6,709,119	B2	3/2004	Gillich et al.
5,835,294	A	11/1998	Minegishi	6,717,610	B1	4/2004	Bos et al.
5,838,505	A	11/1998	Palathingal	6,717,712	B2	4/2004	Lynam et al.
5,847,889	A	12/1998	Komiyama et al.	6,719,215	B2	4/2004	Drouillard
5,863,116	A	1/1999	Pastrick et al.	6,731,205	B2	5/2004	Schofield et al.
5,864,434	A	1/1999	Taylor	6,737,629	B2	5/2004	Nixon et al.
5,877,897	A	3/1999	Schofield et al.	6,742,904	B2	6/2004	Bechtel et al.
5,910,854	A	6/1999	Varaprasad et al.	6,757,109	B2	6/2004	Bos
5,922,176	A	7/1999	Caskey	D493,131	S	7/2004	Lawlor et al.
5,929,786	A	7/1999	Schofield et al.	D493,394	S	7/2004	Lawlor et al.
5,938,320	A	8/1999	Crandall	6,824,281	B2	11/2004	Schofield et al.
5,980,050	A	11/1999	McCord	6,831,268	B2	12/2004	Bechtel et al.
6,001,486	A	12/1999	Varaprasad et al.	6,882,287	B2	4/2005	Schofield
6,002,511	A	12/1999	Varaprasad et al.	6,919,796	B2	7/2005	Boddy et al.
6,002,544	A	12/1999	Yatsu	6,932,483	B2	8/2005	Strumolo et al.
6,005,724	A	12/1999	Todd	6,979,090	B1	12/2005	Wnuk
6,007,207	A	12/1999	Liu	7,005,974	B2	2/2006	McMahon et al.
6,030,084	A	2/2000	Schmidt	7,038,577	B2	5/2006	Pawlicki et al.
6,032,323	A	3/2000	Smith et al.	7,097,312	B2	8/2006	Platzer, Jr.
6,033,078	A	3/2000	Su et al.	7,106,392	B2	9/2006	You
6,065,840	A	5/2000	Caskey et al.	7,126,456	B2	10/2006	Boddy et al.
6,074,068	A	6/2000	Palathingal	7,167,294	B2	1/2007	Lynam et al.
6,097,023	A	8/2000	Schofield et al.	7,168,830	B2	1/2007	Pastrick et al.
6,109,586	A	8/2000	Hock	7,184,190	B2	2/2007	McCabe et al.
6,111,684	A	8/2000	Forgette et al.	7,195,381	B2	3/2007	Lynam et al.
6,116,743	A	9/2000	Hoek	7,249,860	B2	7/2007	Kulas et al.
6,124,647	A	9/2000	Marcus et al.	7,255,451	B2	8/2007	McCabe et al.
6,128,860	A	10/2000	Kepp et al.	7,267,448	B2	9/2007	Schmidt et al.
6,154,306	A	11/2000	Varaprasad et al.	7,274,501	B2	9/2007	McCabe et al.
6,164,564	A	12/2000	Franco et al.	7,289,037	B2	10/2007	Uken et al.
6,172,613	B1	1/2001	DeLine et al.	7,338,177	B2	3/2008	Lynam
6,176,602	B1	1/2001	Pastrick et al.	7,339,149	B1	3/2008	Schofield et al.
6,178,034	B1	1/2001	Allemand et al.	7,345,680	B2	3/2008	David
6,196,688	B1	3/2001	Caskey et al.	7,370,983	B2	5/2008	DeWind et al.
6,198,409	B1	3/2001	Schofield et al.	7,377,675	B2	5/2008	Pastrick et al.
6,199,993	B1	3/2001	Mou	7,391,563	B2	6/2008	McCabe et al.
6,201,642	B1	3/2001	Bos	7,400,435	B2	7/2008	Byers et al.
6,207,083	B1	3/2001	Varaprasad et al.	7,420,756	B2	9/2008	Lynam
6,227,689	B1	5/2001	Miller	7,423,522	B2	9/2008	O'Brien et al.
6,245,262	B1	6/2001	Varaprasad et al.	7,492,281	B2	2/2009	Lynam et al.
6,250,148	B1	6/2001	Lynam	7,526,103	B2	4/2009	Schofield et al.
6,257,746	B1	7/2001	Todd et al.	7,581,859	B2	9/2009	Lynam
6,260,608	B1	7/2001	Kim	7,626,749	B2	12/2009	Baur et al.
6,270,225	B1	8/2001	Goolsby	7,636,188	B2	12/2009	Baur et al.
6,276,821	B1	8/2001	Pastrick et al.	2002/0036828	A1	3/2002	Wong

US 7,934,843 B2

Page 4

2002/0072026	A1 *	6/2002	Lynam et al. .... 432/77	DE	2915521	10/1980
2002/0105741	A1	8/2002	Platzer, Jr.	DE	3302735	8/1984
2002/0159169	A1	10/2002	McCord	DE	3329998	3/1985
2002/0159270	A1	10/2002	Lynam et al.	DE	3620228	12/1987
2003/0043589	A1	3/2003	Blank	DE	4026578	4/1992
2003/0117731	A1	6/2003	Platzer, Jr.	EP	0210757	2/1987
2004/0032638	A1	2/2004	Tonar et al.	EP	0310261	4/1989
2004/0032675	A1	2/2004	Weller et al.	EP	0356099	2/1990
2004/0032676	A1	2/2004	Drummond et al.	EP	0551802	1/1992
2004/0165291	A1	8/2004	Platzer, Jr.	EP	0728618	8/1996
2004/0264011	A1	12/2004	Lynam	EP	0729864	9/1996
2005/0078389	A1	4/2005	Kulas et al.	EP	0791503	8/1997
2005/0083577	A1	4/2005	Varaprasad et al.	EP	0917987	5/1999
2005/0099693	A1	5/2005	Schofield et al.	EP	2628042	3/1988
2005/0134983	A1	6/2005	Lynam	FR	1279158	6/1972
2005/0232469	A1	10/2005	Schofield et al.	GB	2048189	12/1980
2005/0248859	A1	11/2005	Platzer, Jr.	GB	2092534	8/1982
2006/0050018	A1	3/2006	Hutzel et al.	GB	0051637	4/1980
2006/0061008	A1	3/2006	Karner et al.	JP	55076721	10/1980
2006/0125919	A1	6/2006	Camilleri et al.	JP	362075619	4/1987
2006/0126150	A1	6/2006	Tonar et al.	JP	62105103	5/1987
2006/0171704	A1	8/2006	Bingle et al.	JP	1186443	7/1989
2006/0184297	A1	8/2006	Higgins-Luthman	JP	1208245	8/1989
2006/0268440	A1	11/2006	Platzer, Jr.	KR	2002092059	12/2002
2007/0058257	A1	3/2007	Lynam	NL	7908257	6/1981
2007/0285789	A1	12/2007	Lindahl et al.	WO	WO 0181956	11/2001
2008/0212189	A1	9/2008	Baur et al.	WO	WO 2004026633	4/2004
2008/0225421	A1	9/2008	Platzer	WO	WO 2004047421	6/2004
2008/0304170	A1	12/2008	Zhao	WO	WO 2004103772	12/2004
2008/0308219	A1	12/2008	Lynam	WO	WO 2006124682	11/2006
2009/0040306	A1	2/2009	Foote et al.	WO	WO 2007005942	1/2007
2009/0115631	A1	5/2009	Foote et al.	WO	WO 2008051910	5/2008
2009/0237820	A1	9/2009	McCabe et al.			
FOREIGN PATENT DOCUMENTS						
DE		2550095	5/1976			
DE		2647592	4/1978			

\* cited by examiner

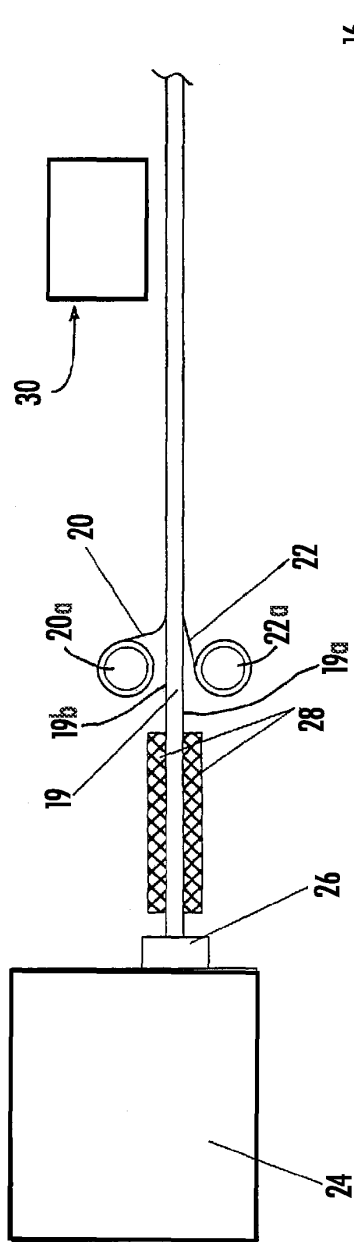


FIG. 5

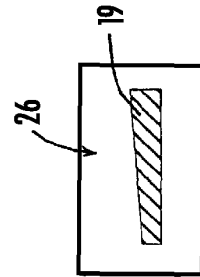


FIG. 5A

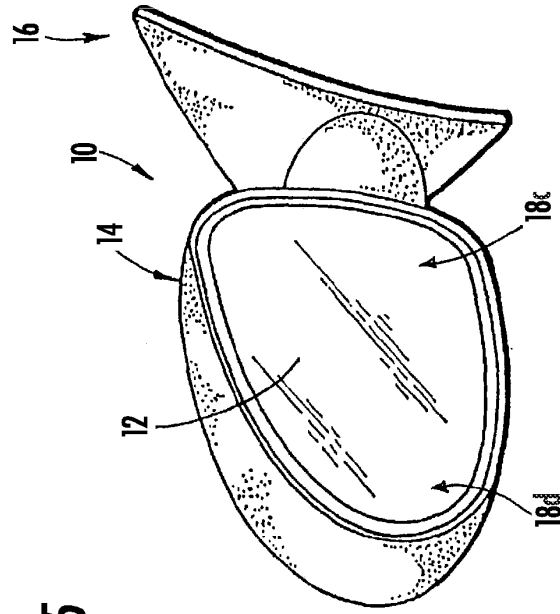


FIG. 7

# 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.