



US007384177B2

(12) **United States Patent**
Parker

(10) **Patent No.:** **US 7,384,177 B2**
(45) **Date of Patent:** **Jun. 10, 2008**

(54) **LIGHT EMITTING PANEL ASSEMBLIES**
(75) Inventor: **Jeffery R. Parker**, Richfield, OH (US)
(73) Assignee: **Solid State Opto Limited** (VG)
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 282 days.

3,043,947 A	7/1962	Albinger, Jr.
3,241,256 A	3/1966	Viret et al.
3,328,570 A	6/1967	Balchunas
3,721,815 A	3/1973	Wall
3,752,974 A	8/1973	Baker et al.
3,760,179 A	9/1973	Addington, Jr.
3,781,537 A	12/1973	Ramsey
3,892,959 A	7/1975	Pulles
3,958,113 A	5/1976	Termohlen
4,043,636 A	8/1977	Eberhardt et al.
4,128,332 A	12/1978	Rowe
4,257,084 A	3/1981	Reynolds
4,277,817 A	7/1981	Hehr
4,323,951 A	4/1982	Pasco
4,373,282 A	2/1983	Wragg
4,446,508 A	5/1984	Kinzie
4,519,017 A	5/1985	Daniel
4,573,766 A	3/1986	Bournay, Jr. et al.
4,630,895 A	12/1986	Abdala, Jr. et al.
4,648,690 A	3/1987	Ohe
4,677,531 A	6/1987	Szeles
4,714,983 A	12/1987	Lang
4,729,067 A	3/1988	Ohe
4,729,068 A	3/1988	Ohe

(21) Appl. No.: **11/244,544**
(22) Filed: **Oct. 6, 2005**

(65) **Prior Publication Data**
US 2006/0028817 A1 Feb. 9, 2006

Related U.S. Application Data
(60) Division of application No. 10/784,527, filed on Feb. 23, 2004, now Pat. No. 7,160,015, which is a division of application No. 09/256,275, filed on Feb. 23, 1999, now Pat. No. 6,712,481, which is a continuation-in-part of application No. 08/778,089, filed on Jan. 2, 1997, now Pat. No. 6,079,838, which is a division of application No. 08/495,176, filed on Jun. 27, 1995, now Pat. No. 5,613,751.

(51) **Int. Cl.**
F21V 7/04 (2006.01)
(52) **U.S. Cl.** **362/601; 362/612; 362/613; 362/623; 362/609; 362/231**
(58) **Field of Classification Search** 362/601, 362/602, 603, 606, 607, 612, 613, 618, 619, 362/620, 623-627, 231, 26, 609
See application file for complete search history.

(56) **References Cited**
U.S. PATENT DOCUMENTS
2,480,178 A 8/1949 Zinberg

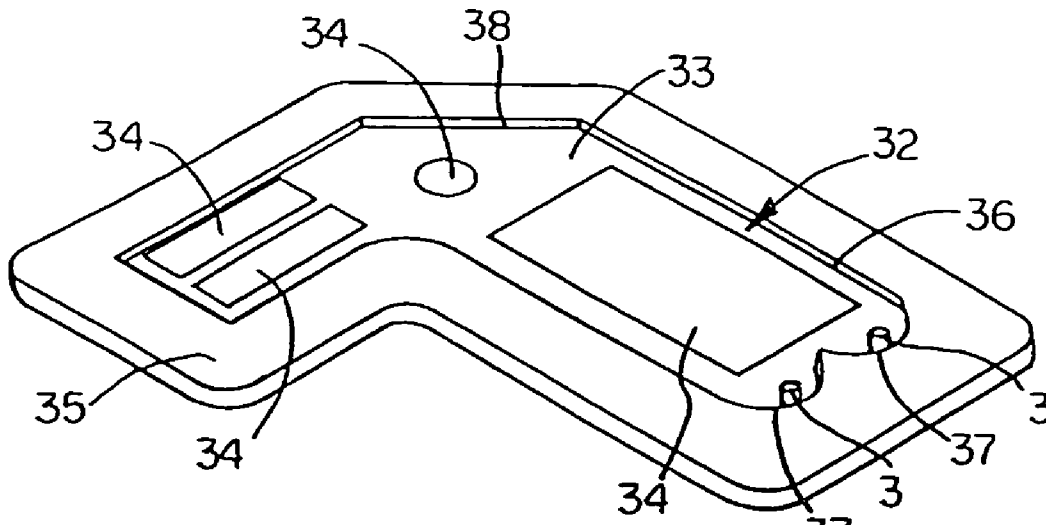
(Continued)

Primary Examiner—Thomas M. Sember
(74) *Attorney, Agent, or Firm*—Renner, Otto, Boisselle & Sklar, LLP

(57) **ABSTRACT**

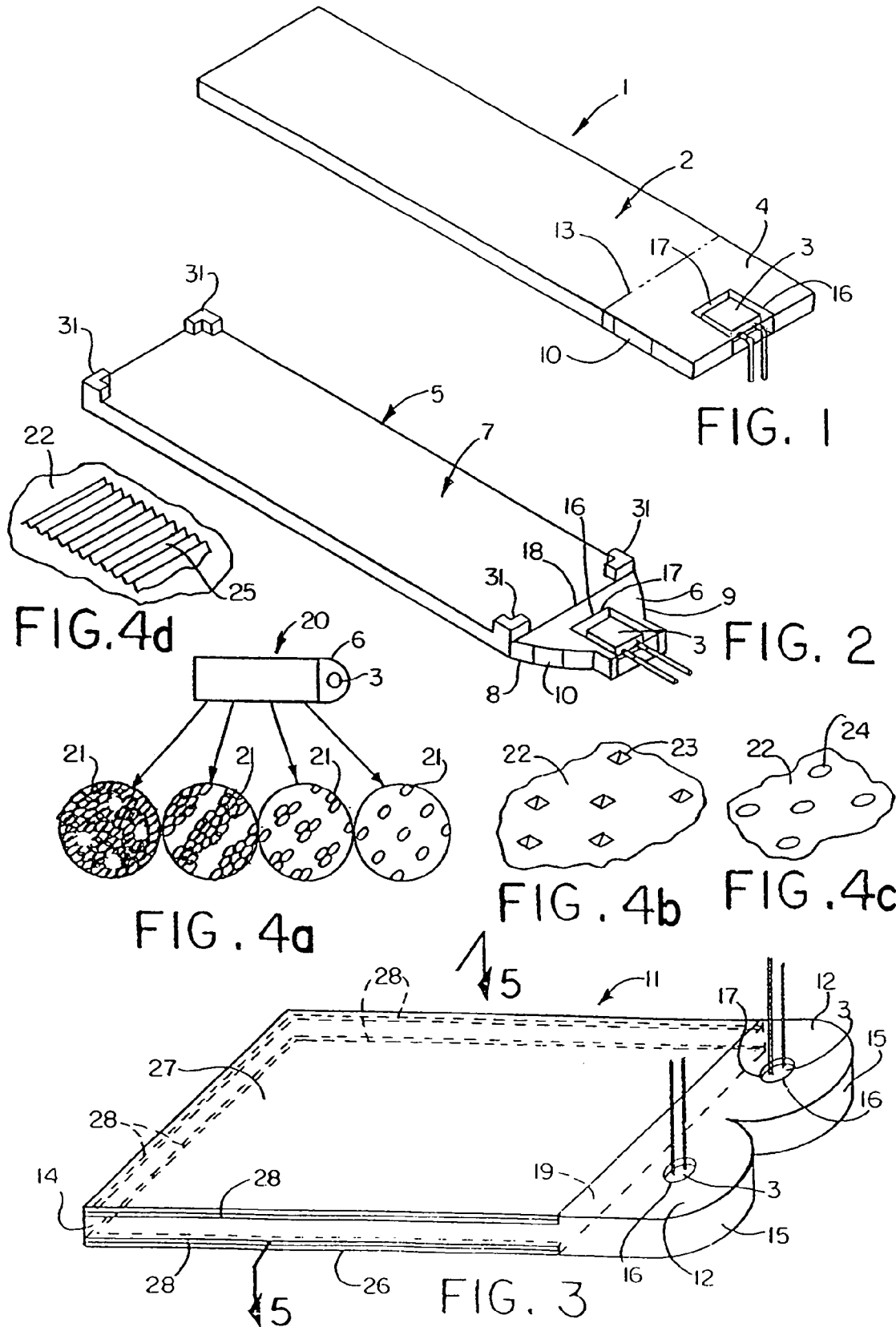
Light emitting assemblies include a tray that forms a cavity or recess containing one or more light sources. A sheet, film or substrate is positioned over the cavity or recess for controlling the light emitted from the assembly. The tray acts as a back, side or edge reflector, and has one or more secondary reflective or refractive surfaces.

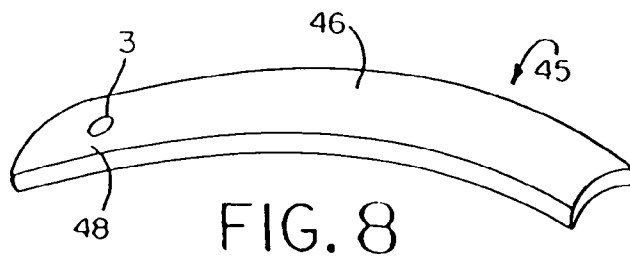
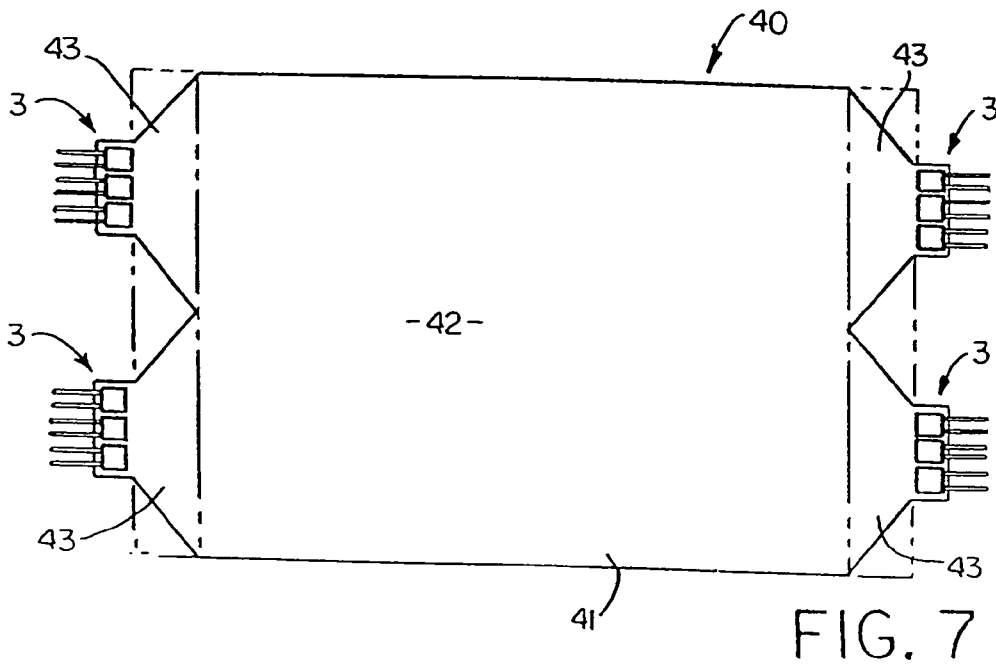
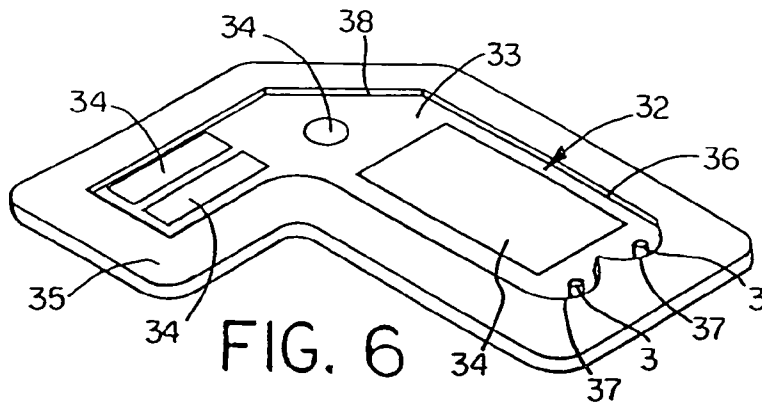
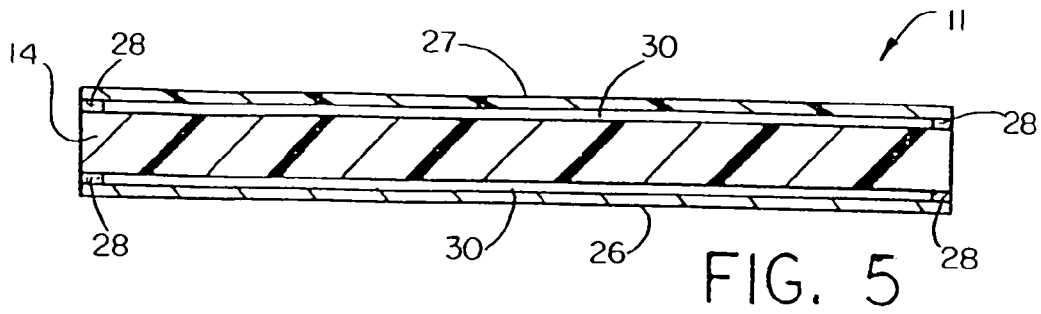
27 Claims, 4 Drawing Sheets



U.S. PATENT DOCUMENTS					
			5,136,480 A	8/1992	Pristash et al.
			5,136,483 A	8/1992	Schoniger et al.
4,729,185 A	3/1988	Baba	5,190,370 A	3/1993	Miller et al.
4,751,615 A	6/1988	Abrams	5,207,493 A	5/1993	Murase et al.
4,761,047 A	8/1988	Mori	5,243,506 A	9/1993	Whitehead
4,763,984 A	8/1988	Awai et al.	5,262,928 A	11/1993	Kashima et al.
4,765,701 A	8/1988	Cheslak	5,283,673 A	2/1994	Murase et al.
4,791,540 A	12/1988	Dreyer, Jr. et al.	5,339,179 A	8/1994	Rudisill et al.
4,802,066 A	1/1989	Mori	5,349,503 A	9/1994	Blonder et al.
4,811,507 A	3/1989	Blanchet	5,375,043 A	12/1994	Tokunaga
4,825,341 A	4/1989	Awai	5,377,084 A	12/1994	Kojima et al.
4,851,824 A *	7/1989	Murata 345/83	5,390,085 A	2/1995	Mari-Roca et al.
4,890,201 A	12/1989	Joft	5,390,436 A	2/1995	Ashall
4,909,604 A	3/1990	Kobayashi et al.	5,394,308 A	2/1995	Watanabe et al.
4,914,553 A	4/1990	Hamada et al.	5,467,208 A	11/1995	Kokawa et al.
4,929,062 A	5/1990	Guzik et al.	5,467,417 A	11/1995	Nakamura et al.
4,974,122 A	11/1990	Shaw	5,477,423 A	12/1995	Fredriksz et al.
4,975,808 A	12/1990	Bond et al.	5,479,275 A	12/1995	Abileah
4,978,952 A	12/1990	Irwin	5,485,291 A	1/1996	Qiao et al.
4,985,809 A	1/1991	Matsui et al.	5,600,455 A	2/1997	Ishikawa et al.
5,005,108 A	4/1991	Pristash et al.	5,719,649 A	2/1998	Shono et al.
5,027,258 A	6/1991	Schoniger et al.	5,947,578 A	9/1999	Ayres
5,055,978 A	10/1991	Rogoff	5,999,685 A	12/1999	Goto et al.
5,070,431 A	12/1991	Kitazawa et al.			
5,093,765 A	3/1992	Kashima et al.			
5,134,549 A	7/1992	Yokoyama			

* cited by examiner





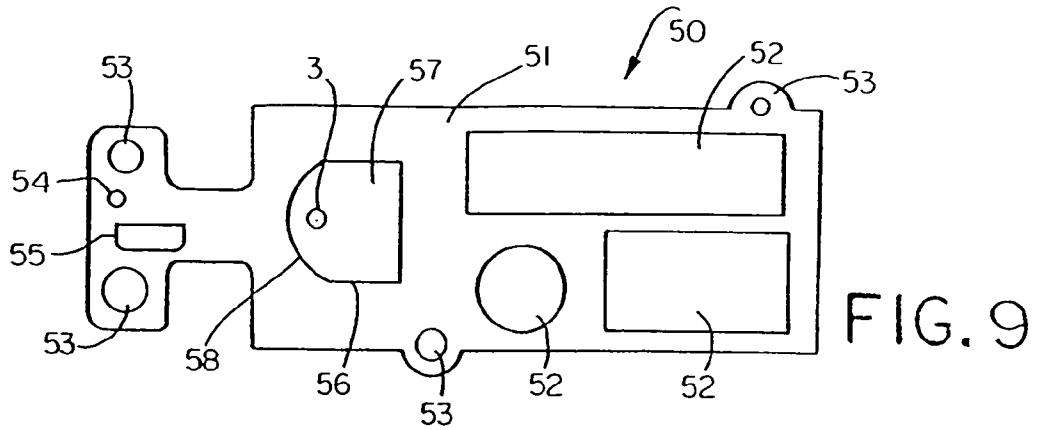


FIG. 9

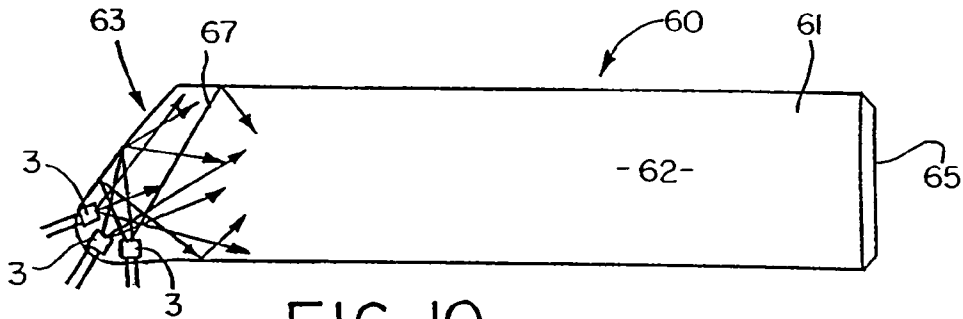


FIG. 10

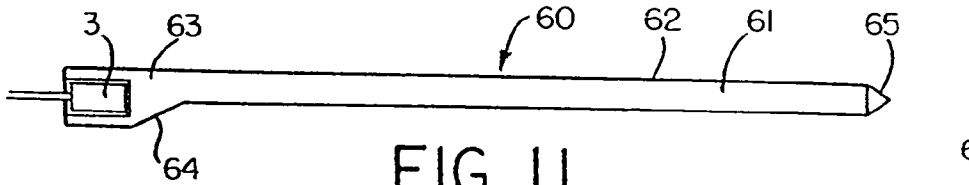


FIG. 11

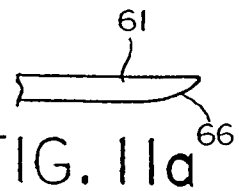


FIG. 11a

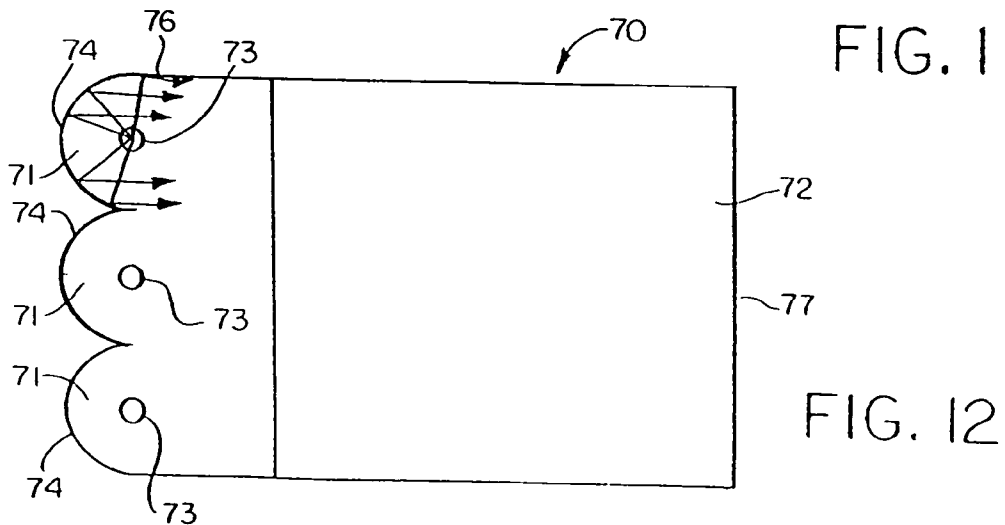


FIG. 12

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.