United States Patent [19]

Chliwnyj et al.

[11] Patent Number: 5,924,784

[45] Date of Patent: Jul. 20, 1999

[54] **MICROPROCESSOR BASED SIMULATED ELECTRONIC FLAME**

[76] Inventors: **Alex Chliwnyj; Tanya D. Chliwnyj,** both of 6380 N. Yuma Mine Rd., Tucson, Ariz. 85743

[21] Appl. No.: **08/698,042**

[22] Filed: **Aug. 15, 1996**

Related U.S. Application Data

[60] Provisional application No. 60/002,547, Aug. 21, 1995.

[51] **Int. Cl.**[6] **F21V 33/00**; H05B 37/04

[52] **U.S. Cl.** **362/234**; 362/253; 362/184; 362/154; 52/128; 52/133; 315/86; 315/324; 307/64

[58] **Field of Search** 52/103, 104, 128, 52/129, 130, 131, 132, 133, 134; 362/251, 183, 191, 802, 121, 807, 132, 184, 806, 800, 307, 310, 311, 145, 153, 153.1, 190, 234, 154, 253; 40/428; 307/48, 64; 315/86, 324, 323, 294, 224, 56, 58, 71

[56] **References Cited**

U.S. PATENT DOCUMENTS

1,794,109	2/1931	Eckert	362/132
2,240,334	4/1941	Kayatt	362/806
2,427,655	9/1947	Blankenship	362/35
3,710,182	1/1973	Van Reenen	315/199
4,324,026	4/1982	Craft	27/1
4,383,244	5/1983	Knauff	340/321
4,453,201	6/1984	Prouty	362/311
4,492,896	1/1985	Jullien	315/153
4,510,556	4/1985	Johnson	362/184
4,605,882	8/1986	DeLuca	315/158
4,777,408	10/1988	DeLuca	315/158
4,839,780	6/1989	Chuan et al.	362/265
4,866,580	9/1989	Blackerby	362/802
4,870,325	9/1989	Kazar	315/178
5,013,972	5/1991	Malkieli et al.	315/209 R
5,030,890	7/1991	Johnson	315/208
5,097,180	3/1992	Ignon et al.	315/200 A

(List continued on next page.)

OTHER PUBLICATIONS

Biodan & LP, Inc. Advertisement, New York and Toronto.

Hewlett Packard, "High Power AlINGaP Amber and Reddish–Orange Lamps", Technical Data, pp. 3–24 –3–29.

Andreycak, B., "Elegantly Simple Off–Line Bias Supply for Very Low Power Applictions", Application Note U–149, pp. 1–11, Integrated Circuits, Unitrode Corporation, 1994.

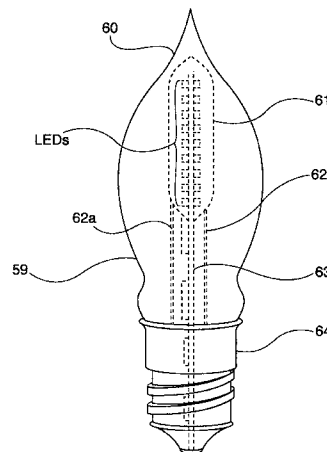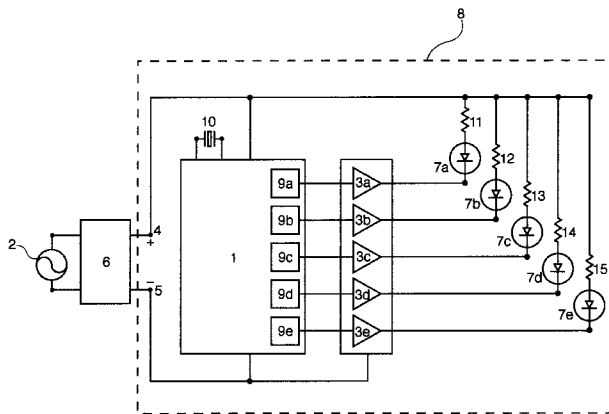"Off–line Power Supply Controller", pp. 1–6, Integrated Circits, Unitrode, Feb. 1995.

[57] **ABSTRACT**

Electronic lighting devices that simulate a realistic flame are disclosed. The preferred embodiment has a plurality of lighting elements in a plurality of colors which are modulated in intensity by a control circuit with a stored program. The control program includes stored amplitude waveforms for the generation of a realistic flame simulation. The program further contains random elements to keep the flame constantly changing. The control circuit has built in power management functions that can control the mean intensity of the simulated flame based on some power management budget with the ability to measure the charge/discharge duration of the power source, when used with a rechargeable power source. The currents to the individual lighting elements are selectable from a set of discrete quantization values. Tables of amplitude modulated time waveforms are stored in the microprocessor memory, from which the real time control data streams for the individual lighting elements are synthesized. By using these stored waveforms many different flame modes can be simulated. Effects such as a random gust of wind and other disturbances are inserted into the flame simulation from time to time. After a simulated disturbance the simulated flame settles back into more of a steady state condition just like a real flame does. The net result is that the simulated flame is a slowly changing series of patterns resulting in soothing and calming effects upon the viewer.

47 Claims, 12 Drawing Sheets

U.S. PATENT DOCUMENTS

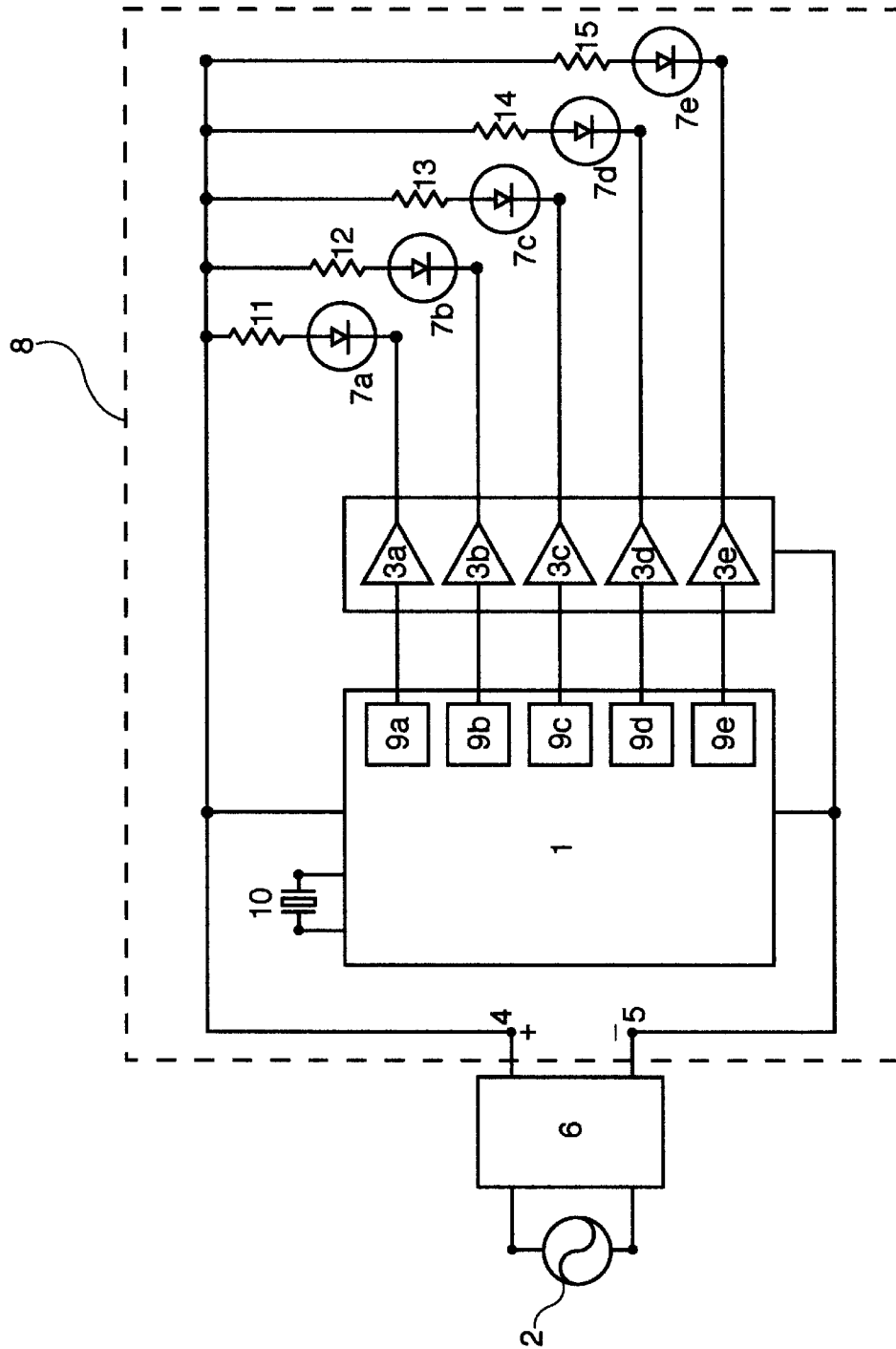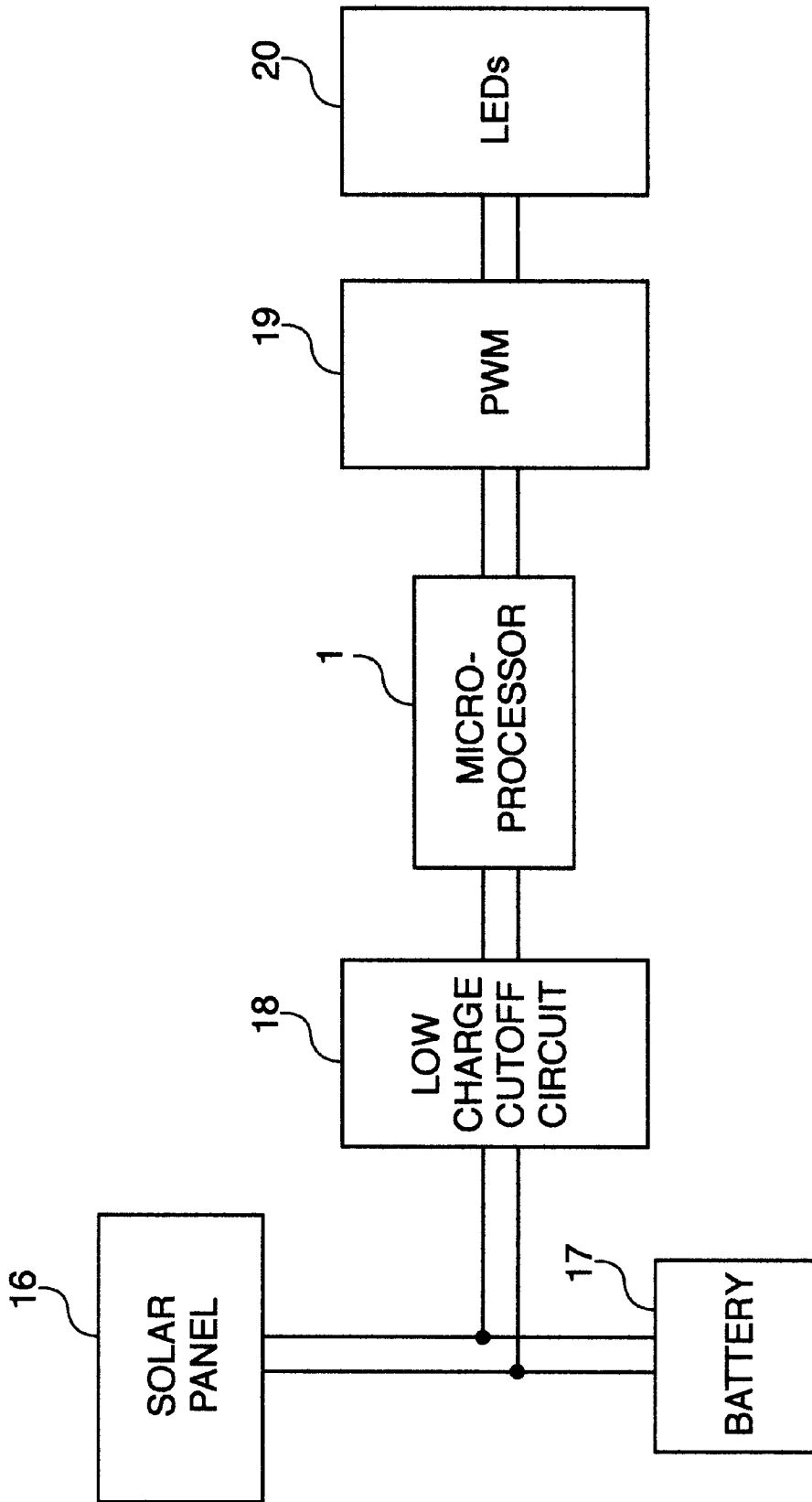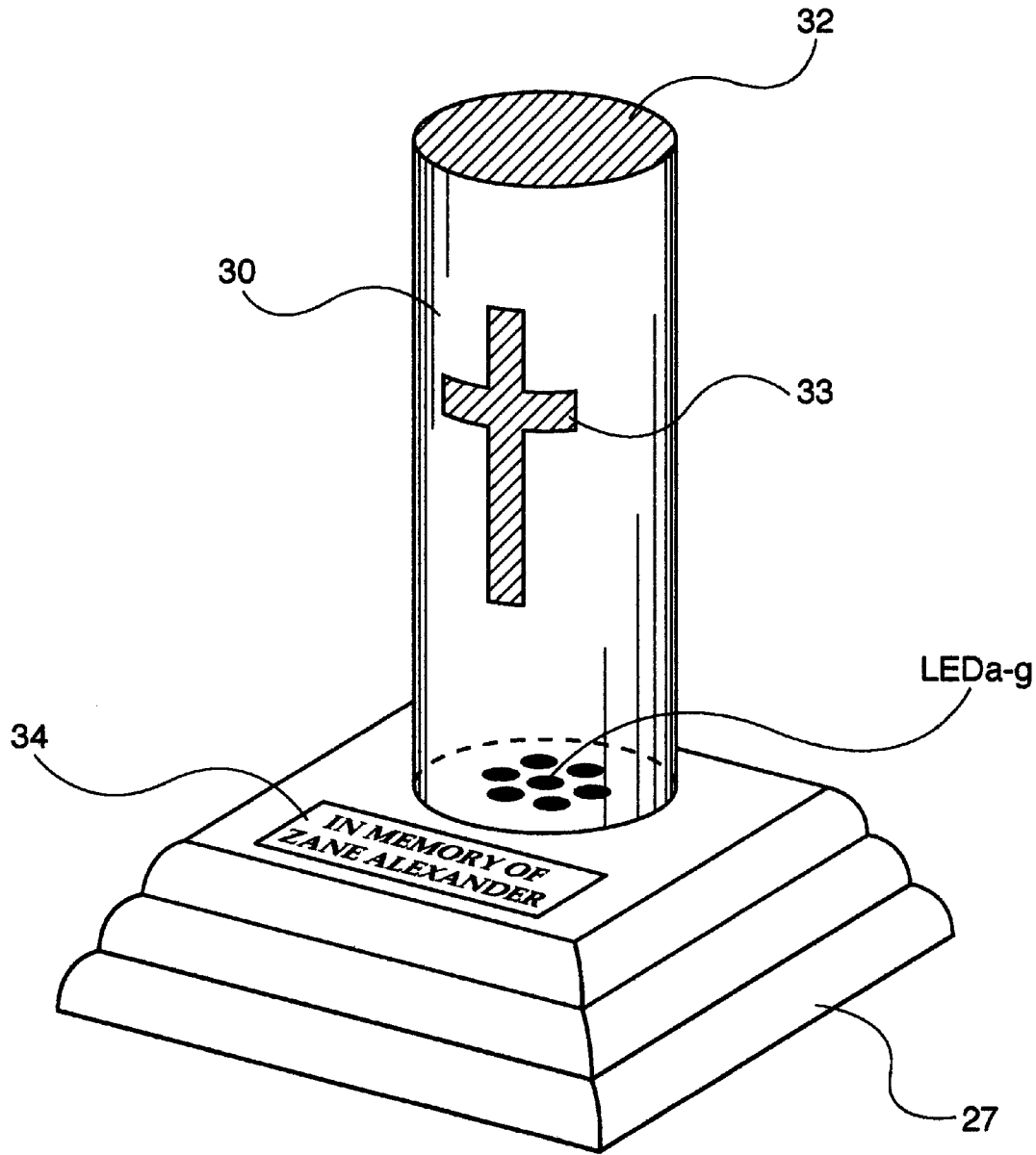|			
5,174,645	12/1992	Chung	362/86
5,252,893	10/1993	Chacham et al.	362/183
5,255,170	10/1993	Plamp et al.	362/183
5,264,761	11/1993	Johnson	315/291
5,294,865	3/1994	Haraden	315/58
5,317,238	5/1994	Schaedel	315/323
5,379,200	1/1995	Echard	362/183
5,463,280	10/1995	Johnson	315/187
5,564,816	10/1996	Arcadia et al.	362/191
5,575,459	11/1996	Anderson	362/800
5,655,830	8/1997	Ruskouski	362/800

Figure 1

Figure 2

Figure 3

DOCKET ALARM

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.

fastcase
Smarter legal research.