



US005766006A

United States Patent [19]**Murljacic**[11] **Patent Number:** **5,766,006**[45] **Date of Patent:** **Jun. 16, 1998**[54] **TOOTH SHADE ANALYZER SYSTEM AND METHODS**[76] **Inventor:** **Maryann Lehmann Murljacic**, 21 Heather La., Darien, Conn. 06820[21] **Appl. No.:** **494,979**[22] **Filed:** **Jun. 26, 1995**[51] **Int. Cl.⁶** **A61C 19/10**[52] **U.S. Cl.** **433/26; 356/408**[58] **Field of Search** **433/26, 29, 203.1, 433/215; 364/413.28; 356/402, 405, 406, 408**

5,313,267	5/1994	MacFarlane et al.	356/405
5,373,364	12/1994	Krzyminski	356/405
5,383,020	1/1995	Vieillefosse	356/405

FOREIGN PATENT DOCUMENTS

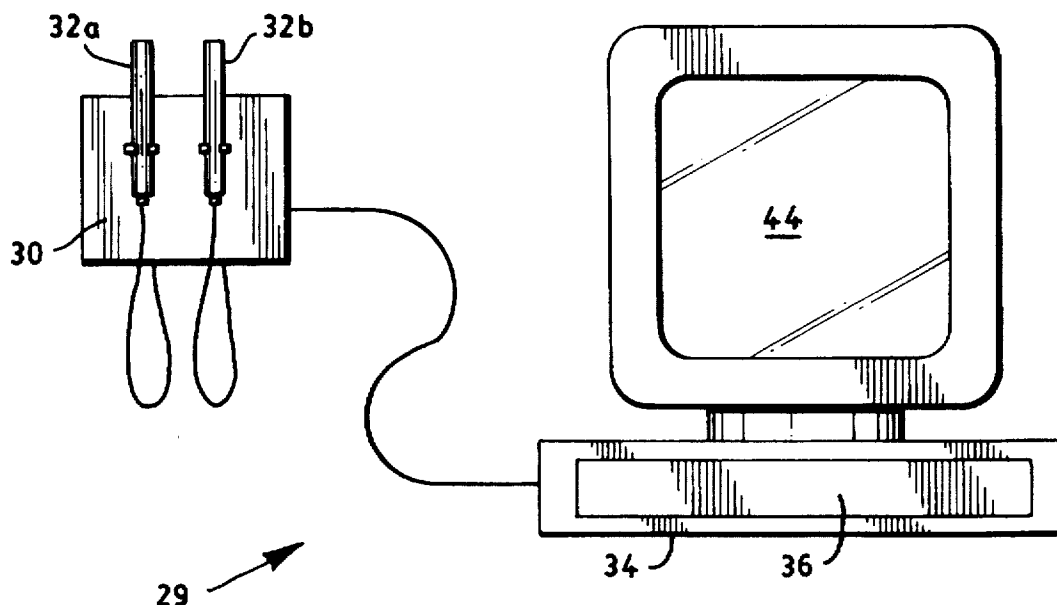
0360657	3/1990	European Pat. Off.	
4301530	10/1992	Japan	356/402
4338465	11/1992	Japan	433/203.1
WO 86/03292	6/1986	WIPO	
9102955	3/1991	WIPO	433/203.1

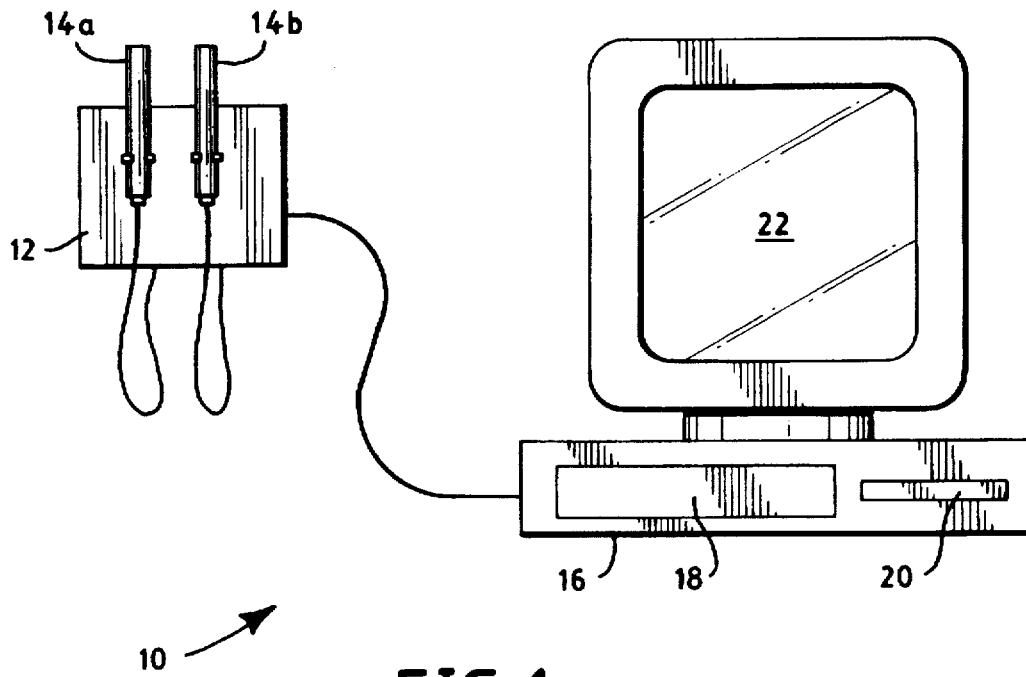
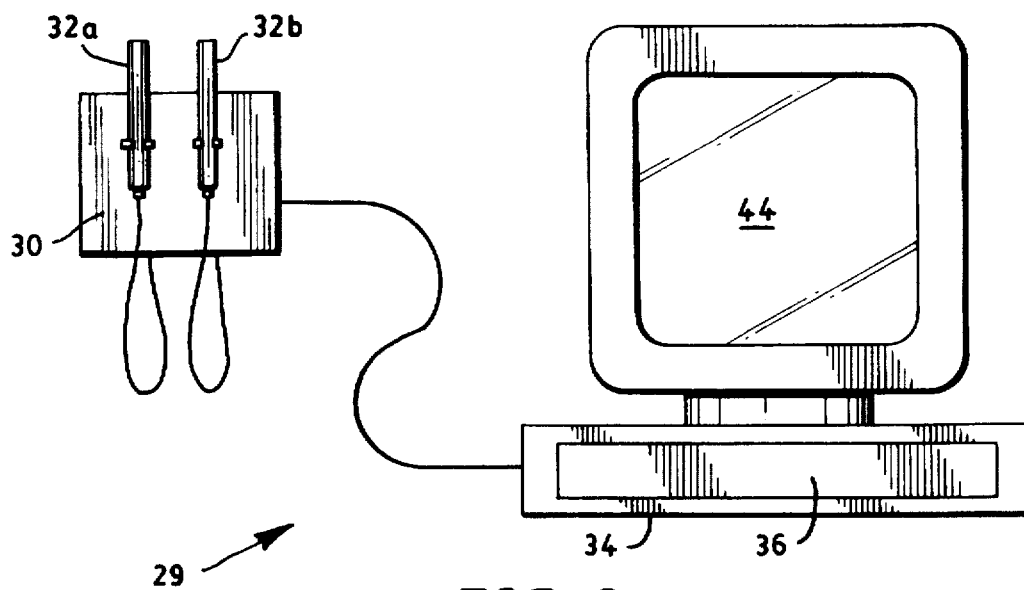
Primary Examiner—Cary E. O'Connor*Attorney, Agent, or Firm*—Curtis A. Vock[57] **ABSTRACT**

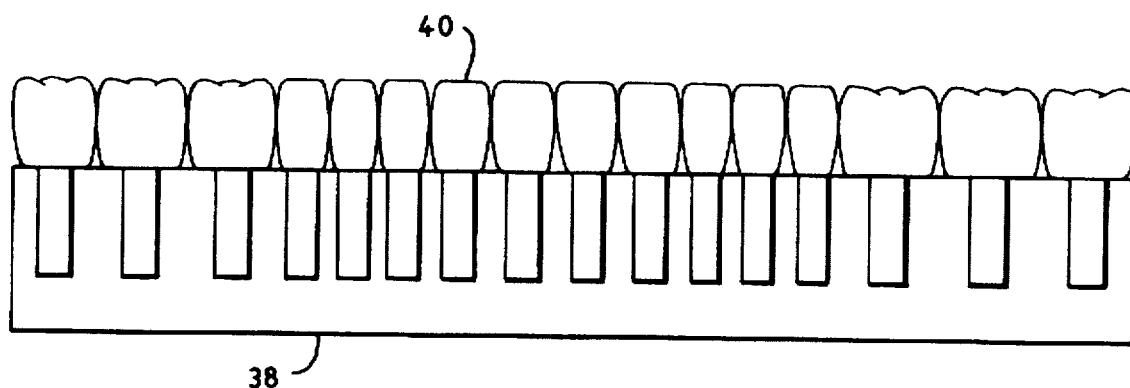
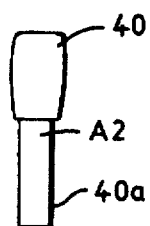
An intraoral camera connects to a shade analyzer subsystem, e.g., a digital video processor, and a color display monitor. The camera captures a digital color image of the patient's tooth and the subsystem compares that image to a stored plurality of tooth shades. Each tooth shade is represented in a block of data, including color image data, a tooth shade digital word, and a manufacturer type. The patient's tooth image includes an RGB chromaticity representation that is scanned and compared with the several tooth shades stored in memory, and a match is determined and communicated to a user of the system. The methodology includes the specification of fractional tooth shades, if needed, corresponding to a plurality of porcelain films for manufacturing a reconstructed tooth.

4 Claims, 8 Drawing Sheets[56] **References Cited****U.S. PATENT DOCUMENTS**

3,986,777	10/1976	Roll	356/176
4,247,202	1/1981	Failes	356/310
4,414,635	11/1983	Gast et al.	364/526
4,518,258	5/1985	Broersma	356/405
4,547,074	10/1985	Hinoda et al.	356/405
4,623,973	11/1986	Hoffrichter et al.	364/526
4,654,794	3/1987	O'Brien	364/413
4,692,481	9/1987	Kelly	523/210
4,836,674	6/1989	Lequime et al.	356/319
4,881,811	11/1989	O'Brien	356/323
5,012,431	4/1991	Stanziola	364/526
5,124,797	6/1992	Williams et al.	433/29
5,231,472	7/1993	Marcus et al.	356/402
5,240,414	8/1993	Thompson	433/26



**FIG. 1** (PRIOR ART)**FIG. 2**

**FIG. 3** (PRIOR ART)**FIG. 3A** (PRIOR ART)

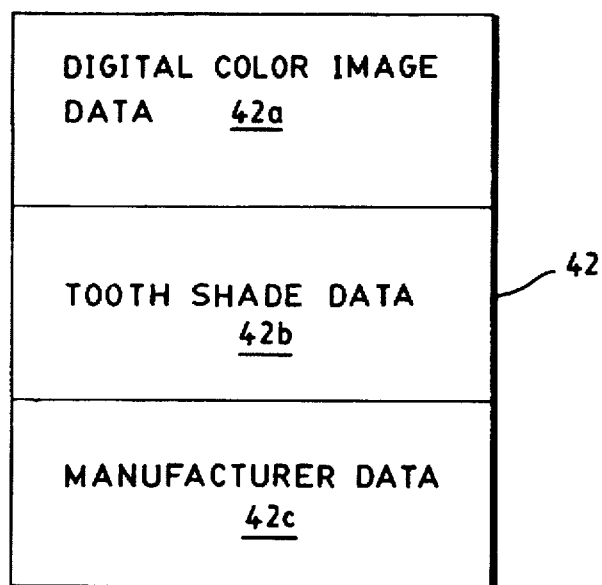


FIG. 4

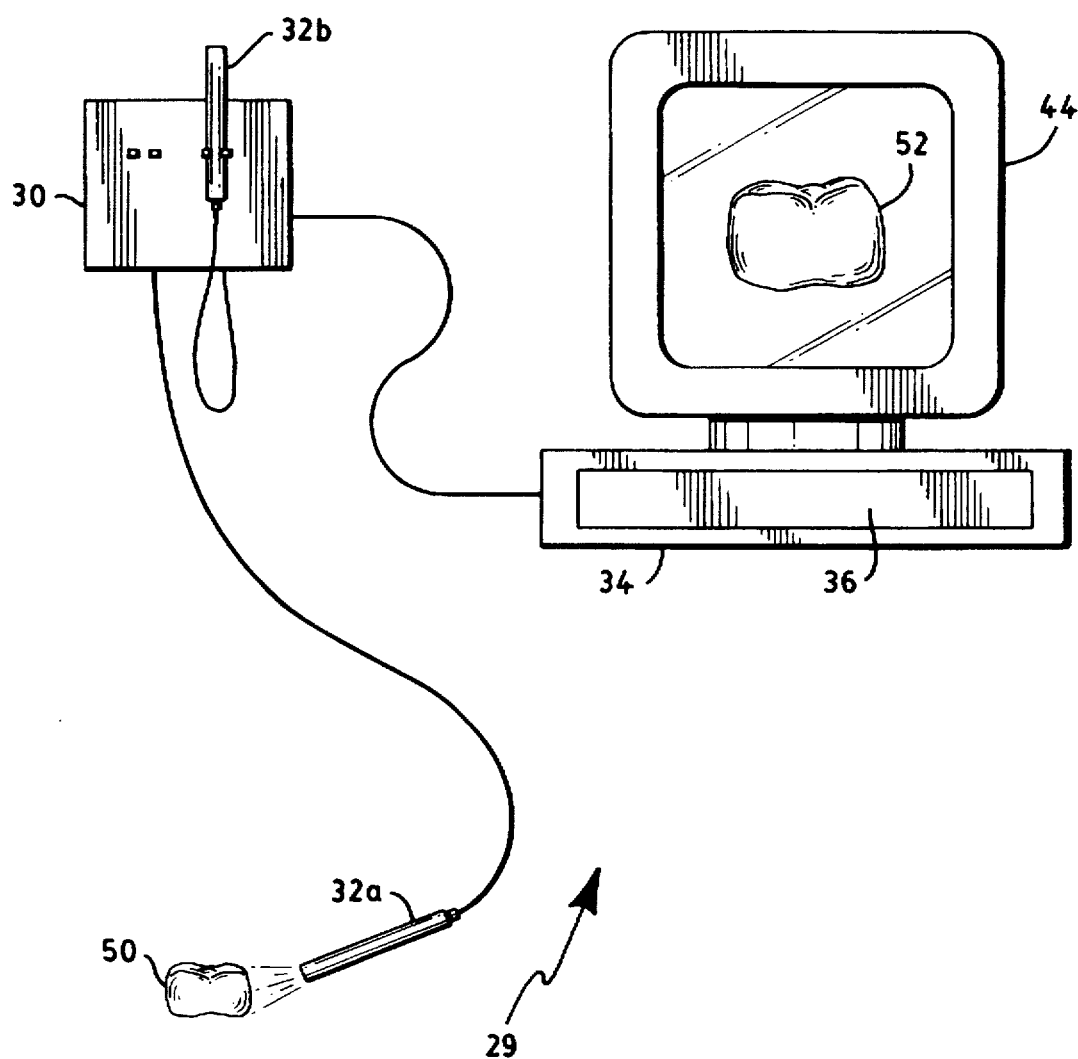


FIG. 5

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.