



US008670819B2

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

(10) **Patent No.:** US 8,670,819 B2
(45) **Date of Patent:** Mar. 11, 2014

(54) **OPTICAL BIOLOGICAL INFORMATION DETECTING APPARATUS AND OPTICAL BIOLOGICAL INFORMATION DETECTING METHOD**

(75) Inventors: **Hiroshi Iwamiya**, Ome (JP); **Shuji Nakajima**, Kunitachi (JP)

(73) Assignee: **Casio Computer Co., Ltd**, Tokyo (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 567 days.

(21) Appl. No.: **12/825,601**

(22) Filed: **Jun. 29, 2010**

(65) **Prior Publication Data**
US 2011/0004106 A1 Jan. 6, 2011

(30) **Foreign Application Priority Data**
Jul. 1, 2009 (JP) 2009-156985
Aug. 18, 2009 (JP) 2009-188987
Dec. 22, 2009 (JP) 2009-291174
Feb. 17, 2010 (JP) 2010-032088

(51) **Int. Cl.**
A61B 6/00 (2006.01)

(52) **U.S. Cl.**
USPC 600/476; 606/9; 604/20

(58) **Field of Classification Search**
CPC A61B 1/227; A61B 5/1076
USPC 600/476; 606/9; 604/20
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,733,224 B2 *	6/2010	Tran	340/540
2005/0177140 A1 *	8/2005	Jay	606/9
2009/0198173 A1 *	8/2009	Samuel et al.	604/20
2010/0191125 A1 *	7/2010	Foged et al.	600/476

FOREIGN PATENT DOCUMENTS

JP	2000-116611	4/2000
JP	2001-353133	12/2001
JP	2004-337605	12/2004
JP	2008-237686	10/2008

OTHER PUBLICATIONS

Japanese Office Action for Application No. 2010-032088 mailed on Nov. 16, 2011.

* cited by examiner

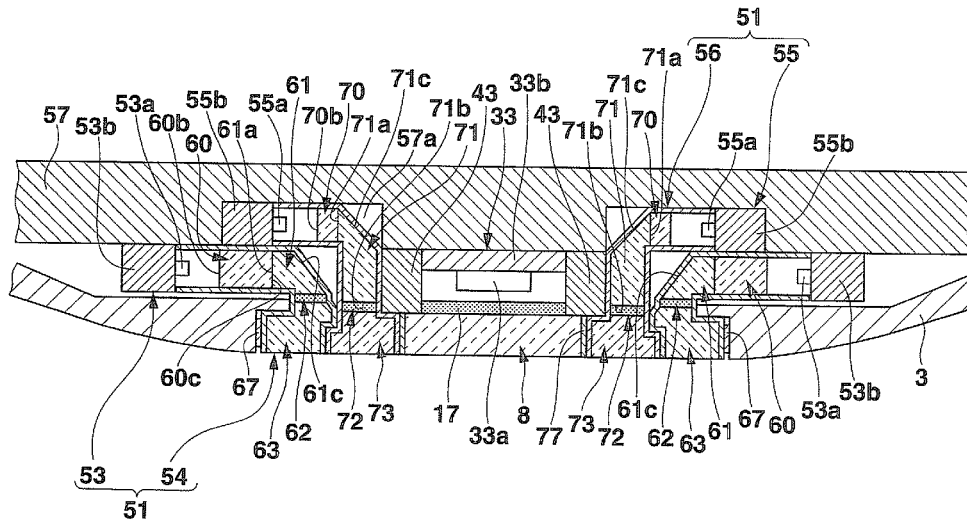
Primary Examiner — Baisakhi Roy

(74) *Attorney, Agent, or Firm* — Turocy & Watson, LLP

(57) **ABSTRACT**

An optical biological information detecting apparatus includes a light emitting unit which emits observation light of a specific wavelength band to optically observe a desired portion of a tissue of a skin of a human body, and an annular light guide unit which guides the observation light to a desired area of a surface of the skin corresponding to the desired portion of the tissue of the skin, and which annularly irradiates the observation light onto the desired area of the surface of the skin. The apparatus further includes a light receiving unit which is disposed at a position surrounded by the annular light guide unit, and which receives scattered light scattered by the desired portion of the tissue of the skin after the observation light is annularly irradiated onto the desired area of the surface of the skin by the annular light guide unit.

9 Claims, 25 Drawing Sheets



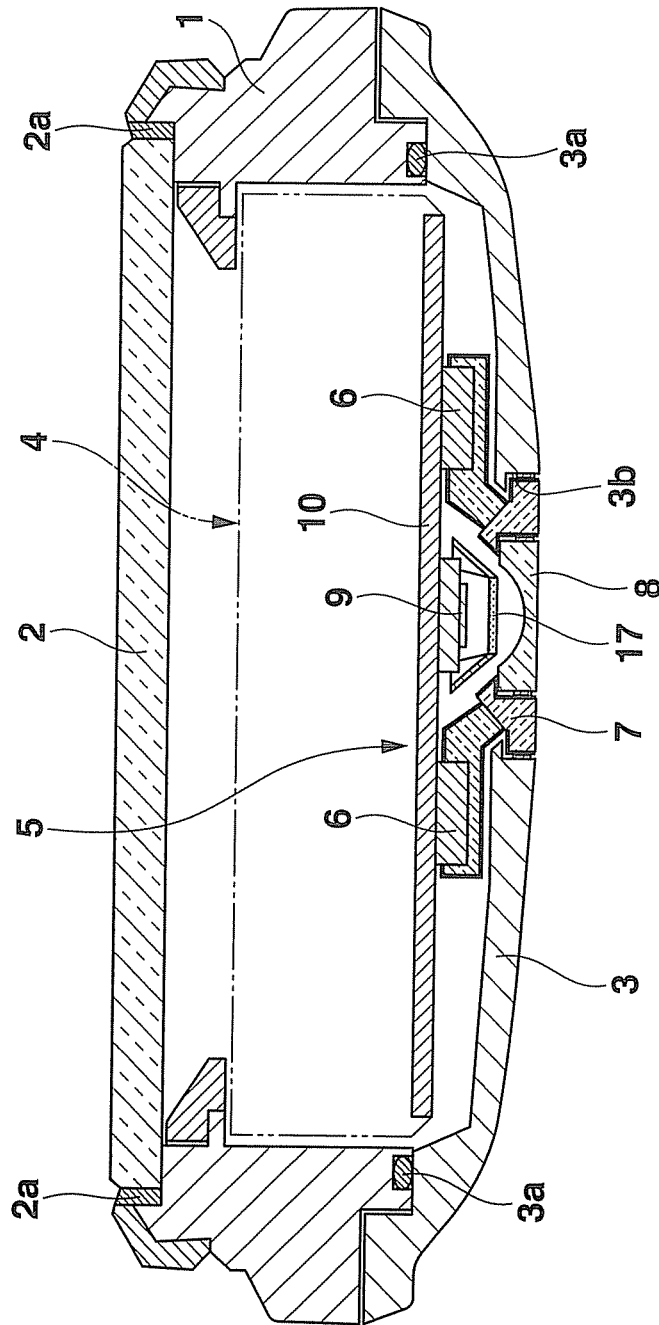


FIG.1

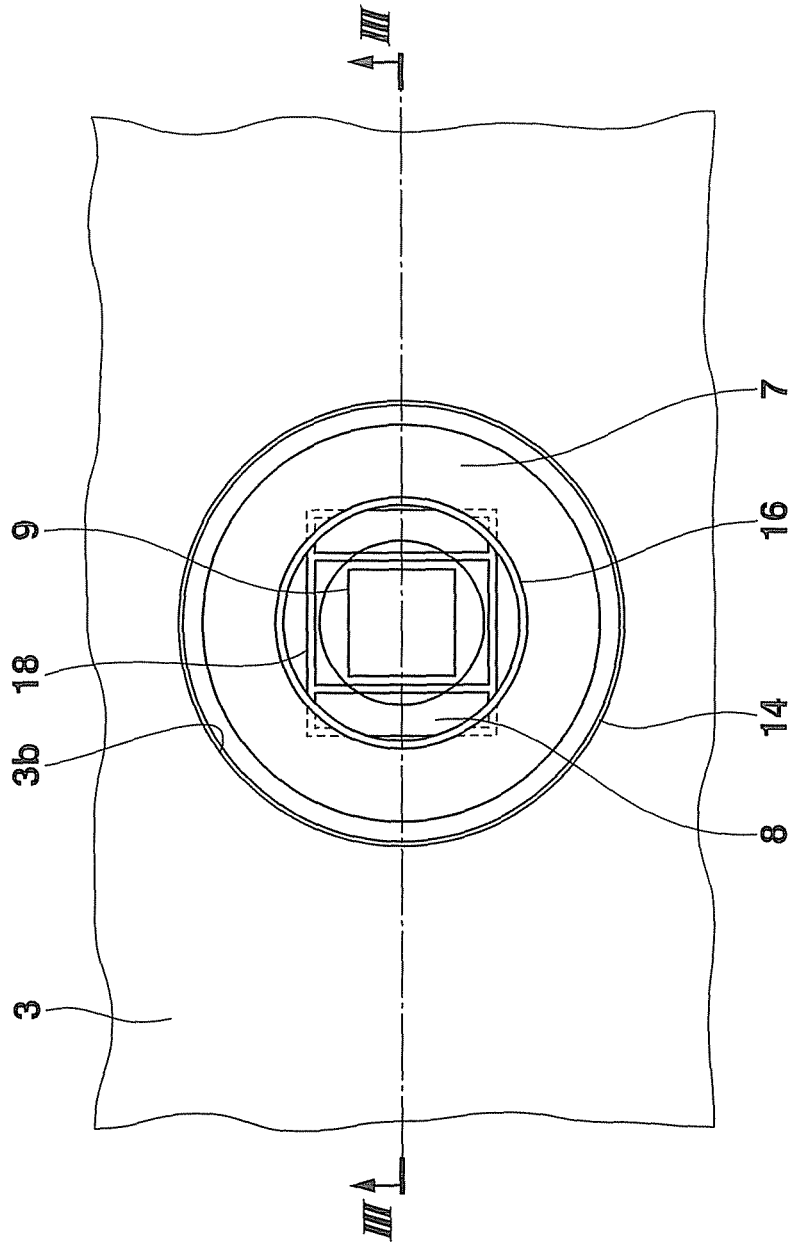


FIG. 2

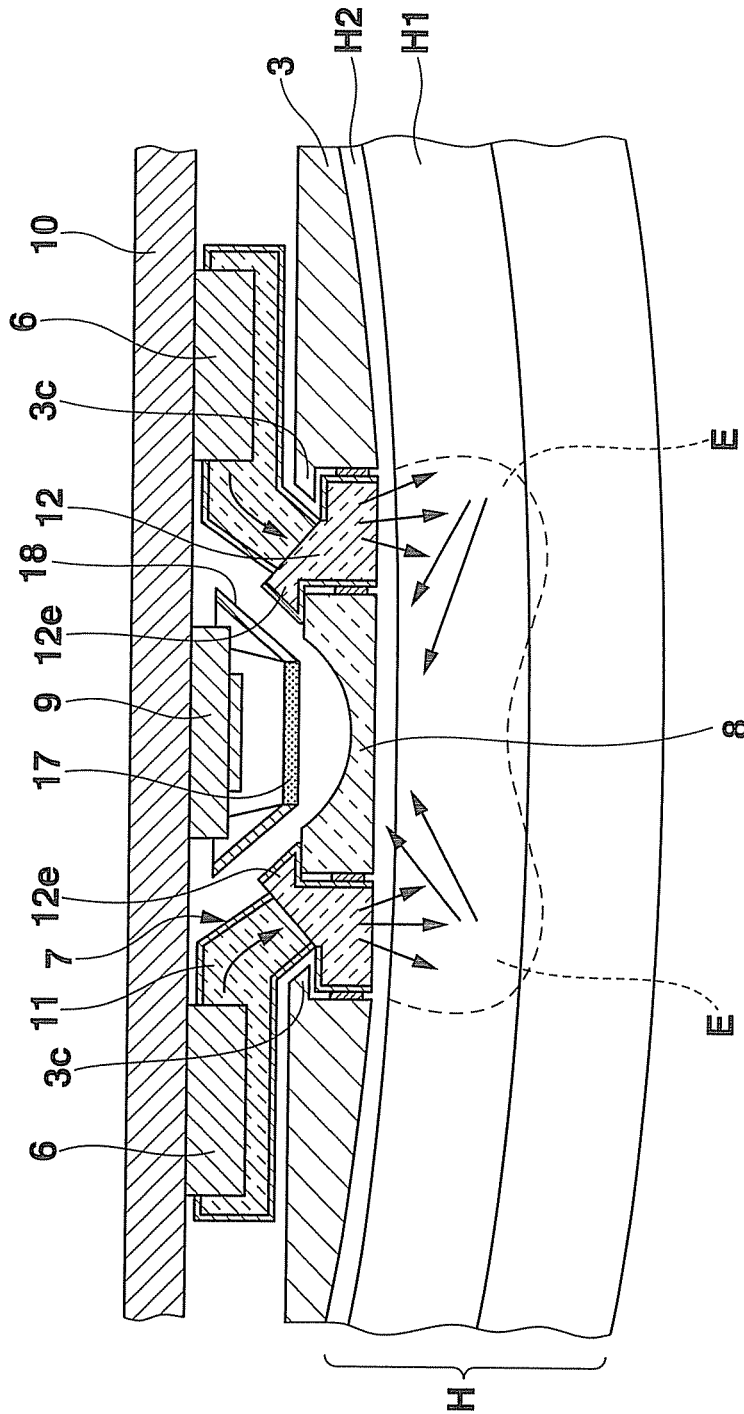


FIG.4

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.