



US008291904B2

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

(10) **Patent No.:** **US 8,291,904 B2**  
(45) **Date of Patent:** **\*Oct. 23, 2012**

(54) **GAS DELIVERY DEVICE AND SYSTEM**

(56) **References Cited**

(75) Inventors: **Duncan P. Bathe**, Fitchburg, WI (US);  
**John Klaus**, Cottage Grove, WI (US);  
**David Christensen**, Cambridge, WI (US)

U.S. PATENT DOCUMENTS

6,089,229	A *	7/2000	Bathe et al.	128/204.21
6,109,260	A	8/2000	Bathe	
6,125,846	A	10/2000	Bathe et al.	
6,164,276	A	12/2000	Bathe et al.	
6,581,592	B1	6/2003	Bathe et al.	
2002/0044059	A1*	4/2002	Reeder et al.	340/573.1
2005/0172966	A1	8/2005	Blaise et al.	
2009/0266358	A1*	10/2009	Rock et al.	128/203.26
2011/0041849	A1*	2/2011	Chen et al.	128/204.23
2011/0240019	A1*	10/2011	Fine et al.	128/202.26

(73) Assignee: **INO Therapeutics LLC**, Hampton, NJ (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.

OTHER PUBLICATIONS

"PCT International Search Report and Written Opinion for PCT/US2011/020319", Jan. 31, 2012, 19 pages.

\* cited by examiner

(21) Appl. No.: **13/493,493**

(22) Filed: **Jun. 11, 2012**

*Primary Examiner* — Kristen Matter

(74) *Attorney, Agent, or Firm* — Diehl Servilla LLC

(65) **Prior Publication Data**

US 2012/0240927 A1 Sep. 27, 2012

**Related U.S. Application Data**

(63) Continuation of application No. 13/509,873, filed as application No. PCT/US2011/020319 on Jan. 6, 2011.

(51) **Int. Cl.**

**A61M 15/00** (2006.01)

**F16K 31/02** (2006.01)

**A62B 9/02** (2006.01)

(52) **U.S. Cl.** ..... **128/205.24**; 128/203.14; 128/204.22

(58) **Field of Classification Search** ..... 128/204.18, 128/204.21-204.23, 205.24, 203.12, 203.14, 128/200.24, 205.11, 205.23

See application file for complete search history.

(57) **ABSTRACT**

A gas delivery system including a gas delivery device, a control module and a gas delivery mechanism is described. An exemplary gas delivery device includes a valve assembly with a valve and circuit including a memory, a processor and a transceiver in communication with the memory. The memory may include gas data such as gas identification, gas expiration and gas concentration. The transceiver on the circuit of the valve assembly may send wireless optical line-of-sight signals to communicate the gas data to a control module. Exemplary gas delivery mechanisms include a ventilator and a breathing circuit. Methods of administering gas are also described.

**16 Claims, 12 Drawing Sheets**

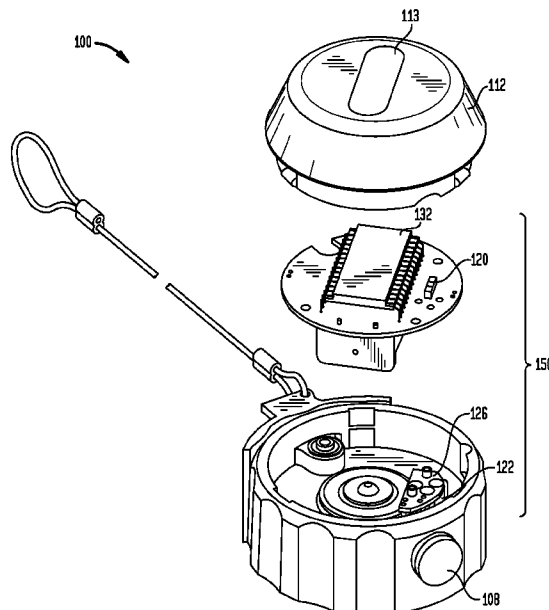




FIG. 2

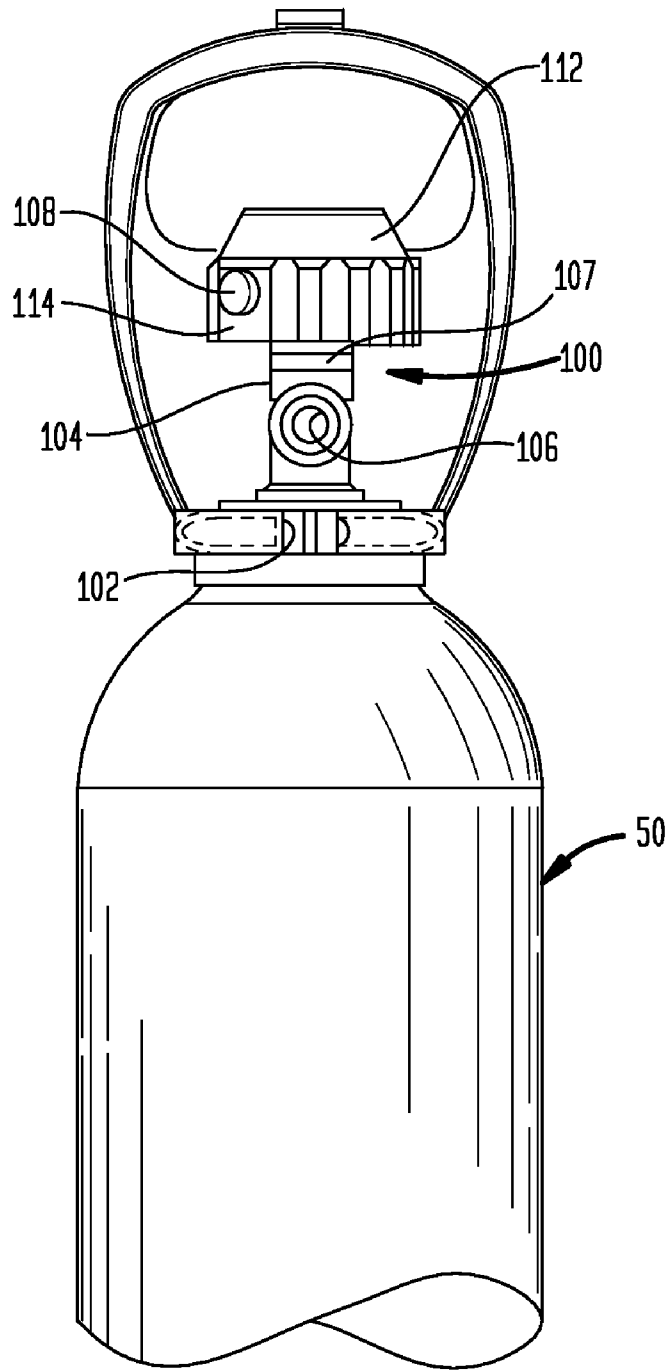


FIG. 3

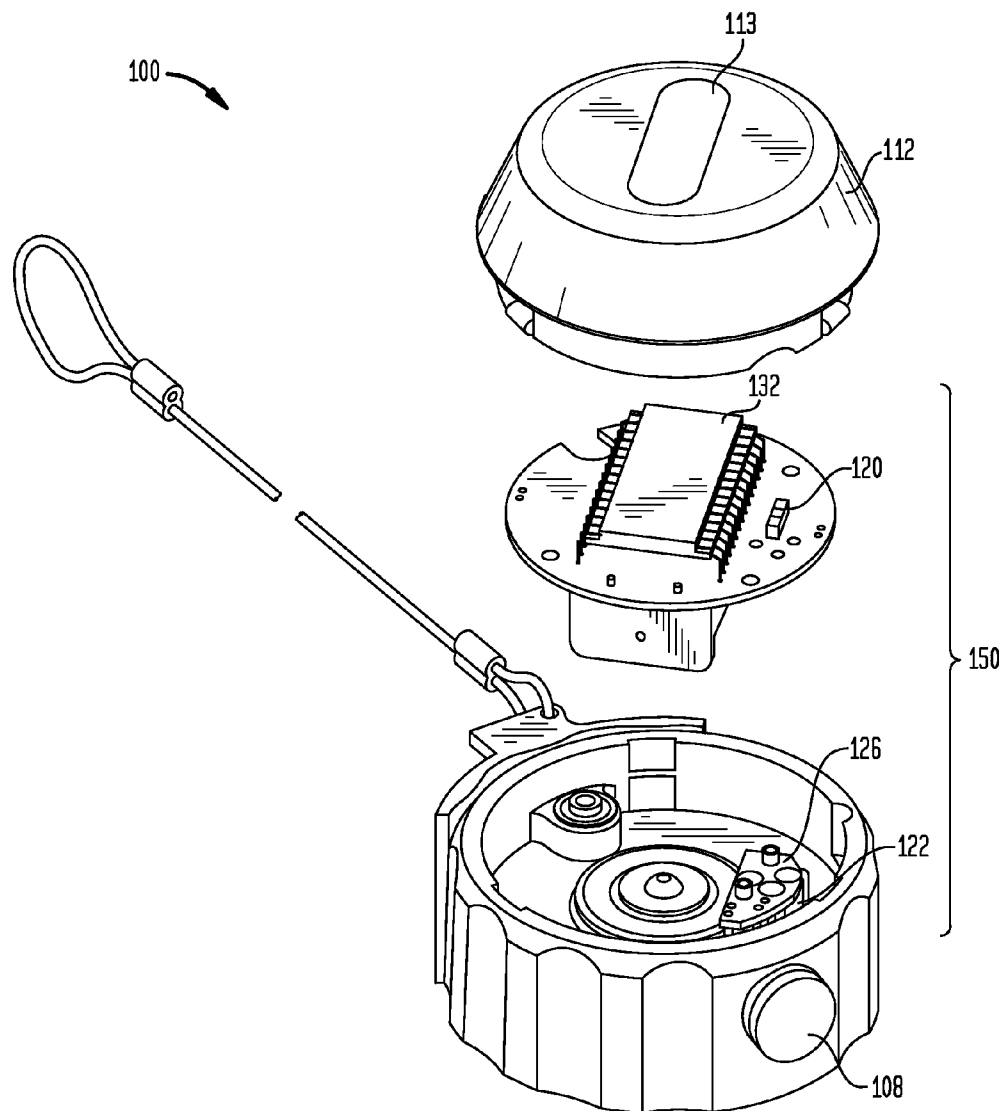


FIG. 4

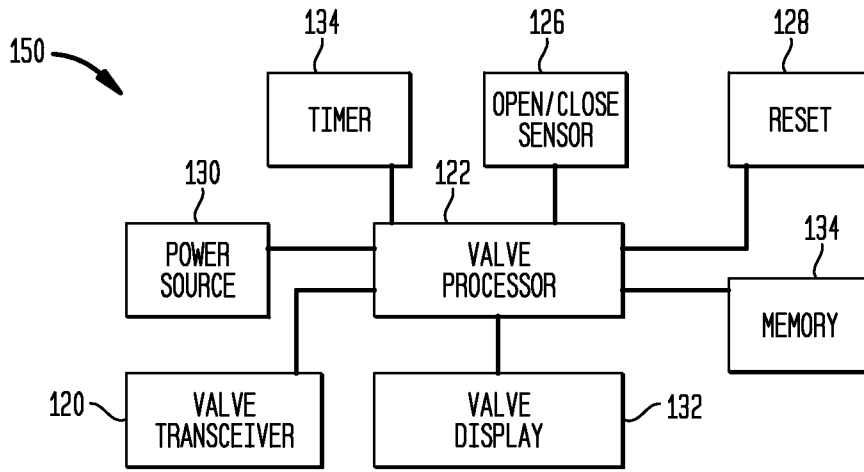
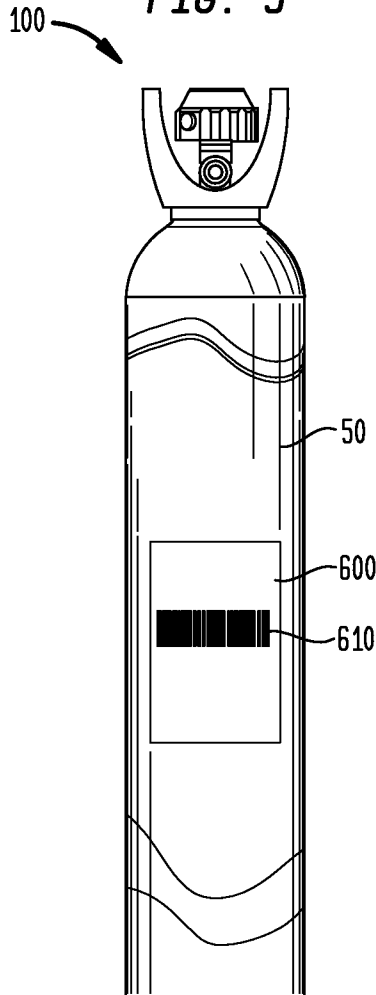


FIG. 5



# 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.