



US006251259B1

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

(10) **Patent No.:** **US 6,251,259 B1**  
(45) **Date of Patent:** **Jun. 26, 2001**

(54) **METHOD AND APPARATUS FOR PRODUCING ELECTROLYZED WATER**

(75) Inventors: **Fumitake Satoh; Kazuyoshi Arai; Tomoyuki Yanagihara; Tatsuya Naitoh**, all of Kanagawa-ken (JP)

(73) Assignee: **MIZ Co., Ltd.**, Fujisawa (JP)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/284,483**

(22) PCT Filed: **May 27, 1998**

(86) PCT No.: **PCT/JP98/02324**

§ 371 Date: **Apr. 22, 1999**

§ 102(e) Date: **Apr. 22, 1999**

(87) PCT Pub. No.: **WO99/10286**

PCT Pub. Date: **Mar. 4, 1999**

(30) **Foreign Application Priority Data**

Aug. 27, 1997 (JP) ..... 9-246060

(51) **Int. Cl.<sup>7</sup>** ..... **C25B 15/00; C02F 1/461**

(52) **U.S. Cl.** ..... **205/744; 205/746; 204/229.6; 204/252**

(58) **Field of Search** ..... **204/252, 282, 204/253, 229.6, 257; 205/742, 746, 744**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,908,109	*	3/1990	Wright	205/744	X
5,015,354	*	5/1991	Nishiki et al.	204/282	X
5,304,289	*	4/1994	Hayakawa	205/744	X
5,853,562	*	12/1998	Eki et al.	204/229.6	X

FOREIGN PATENT DOCUMENTS

7-331475	12/1995	(JP)	.
8-74082	3/1996	(JP)	.
9-28769	2/1997	(JP)	.

\* cited by examiner

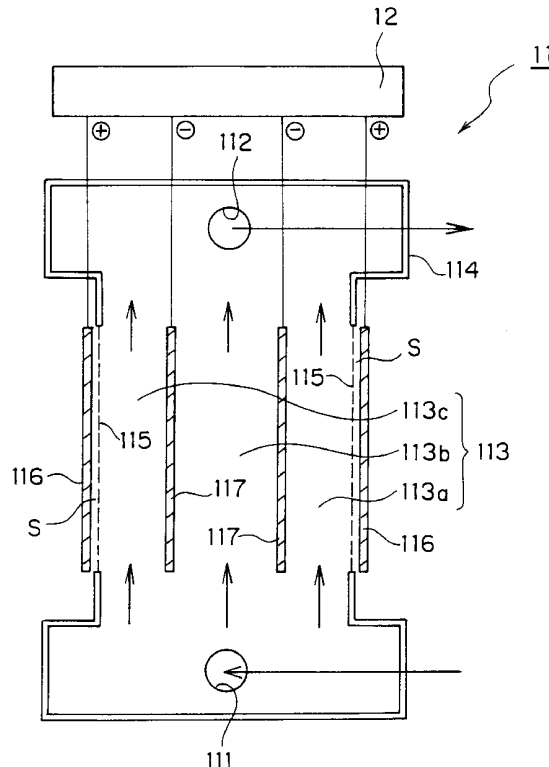
*Primary Examiner*—Donald R. Valentine

(74) *Attorney, Agent, or Firm*—Arent Fox Kintner Plotkin & Kahn, PLLC

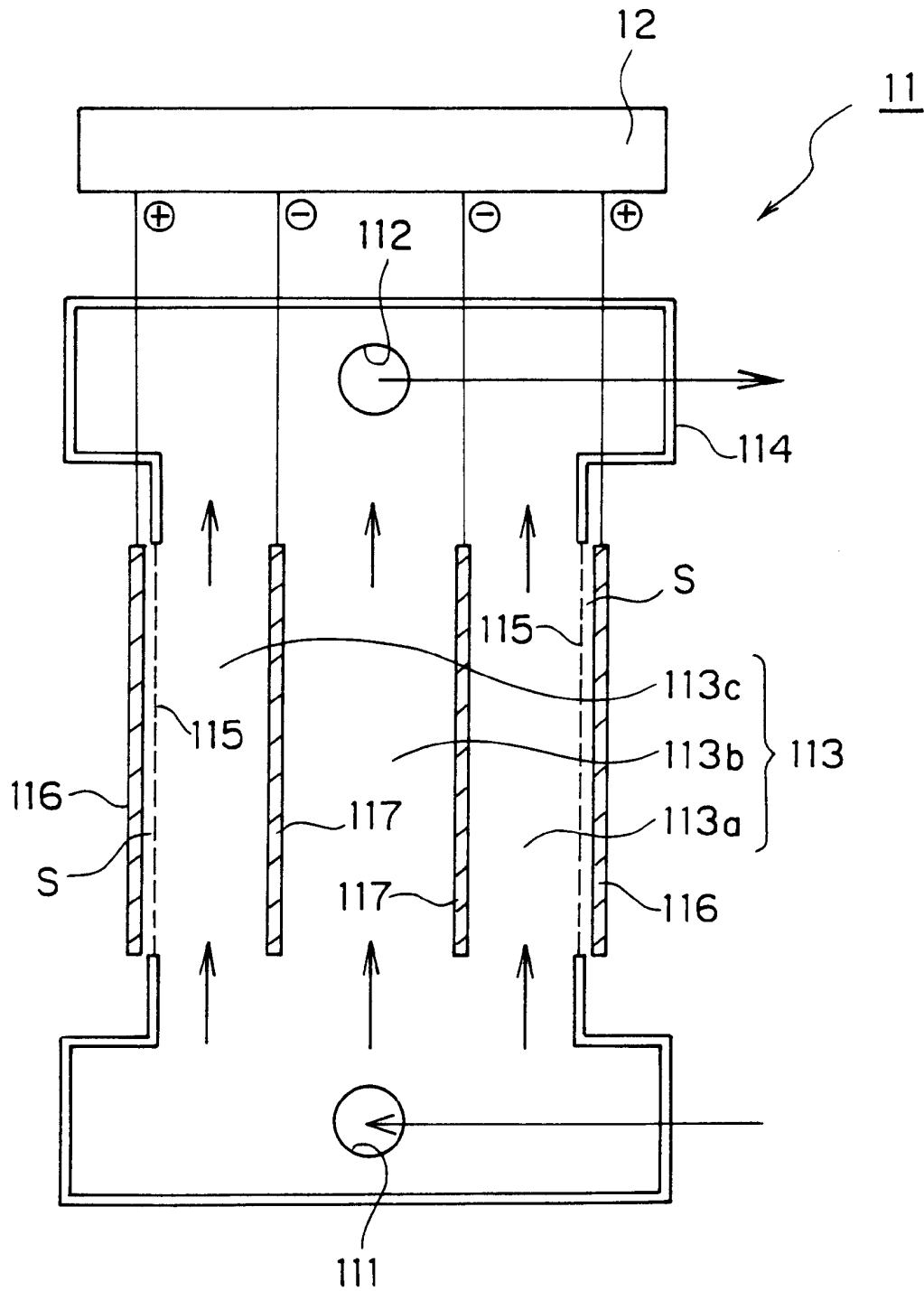
(57) **ABSTRACT**

An electrolytic cell capable of controlling the pH and the ORP independently to each other, comprising an electrolytic chamber (113) to which subject water to be electrolyzed are supplied, membranes (115, 115) provided on the both side walls of the electrolytic chamber, a pair of electrode plates (116, 117) respectively provided inside the electrolyzed chamber and outside the electrolytic chamber sandwiching the membrane therebetween, and wherein the electrode plate (116) is provided outside the electrolytic chamber in contact with the membrane (115) or leaving a slight space.

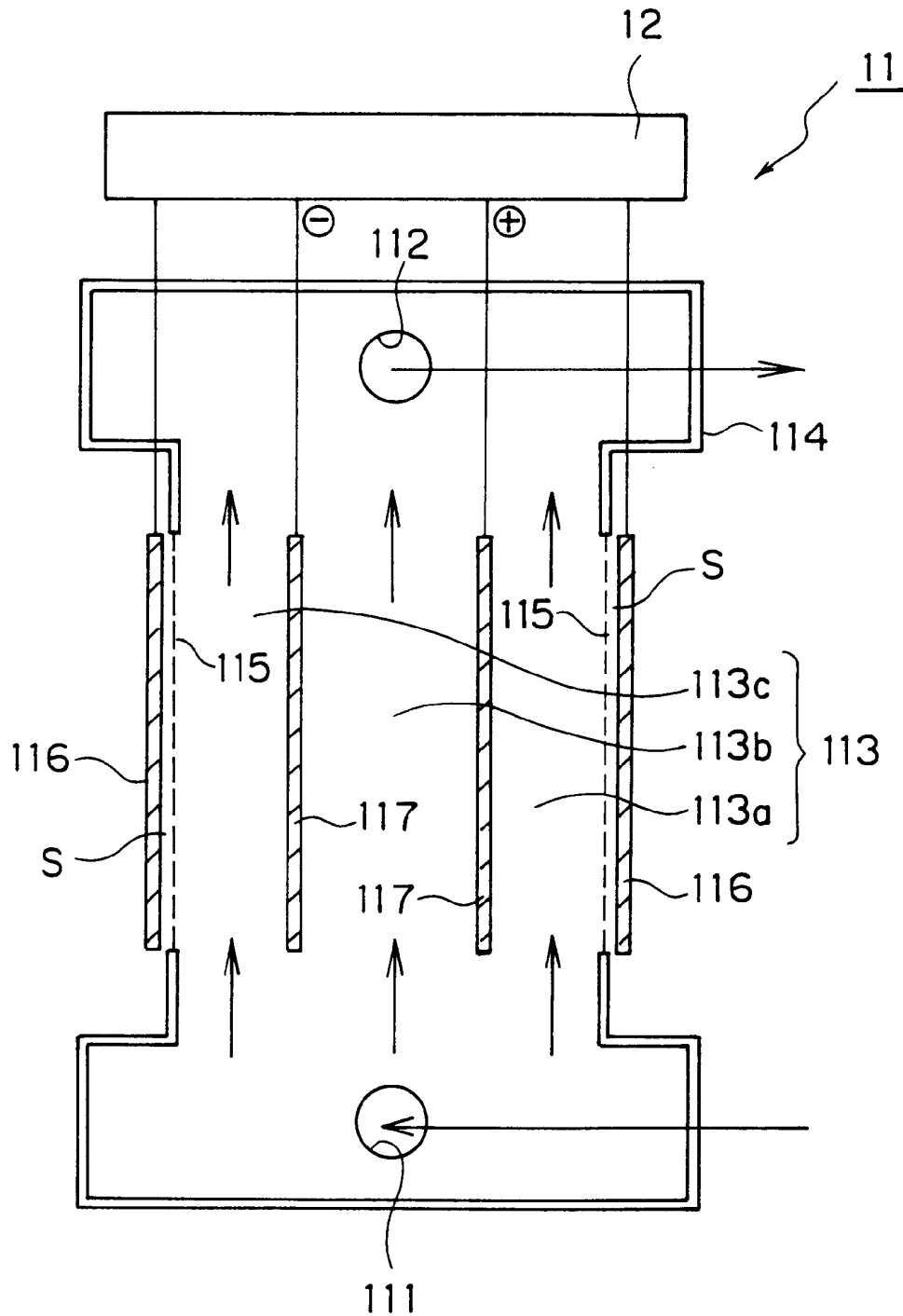
**10 Claims, 13 Drawing Sheets**



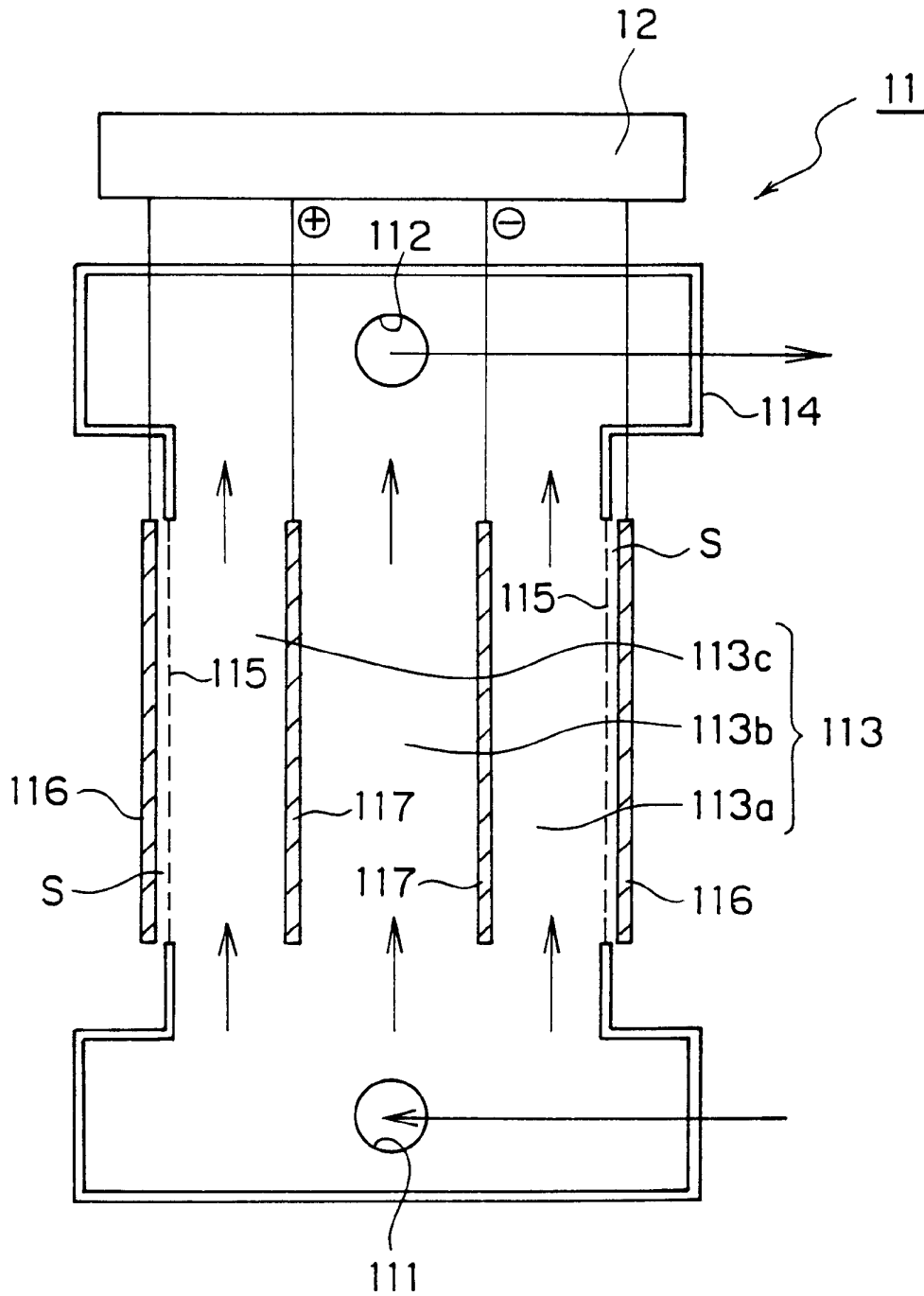
# FIG. 1



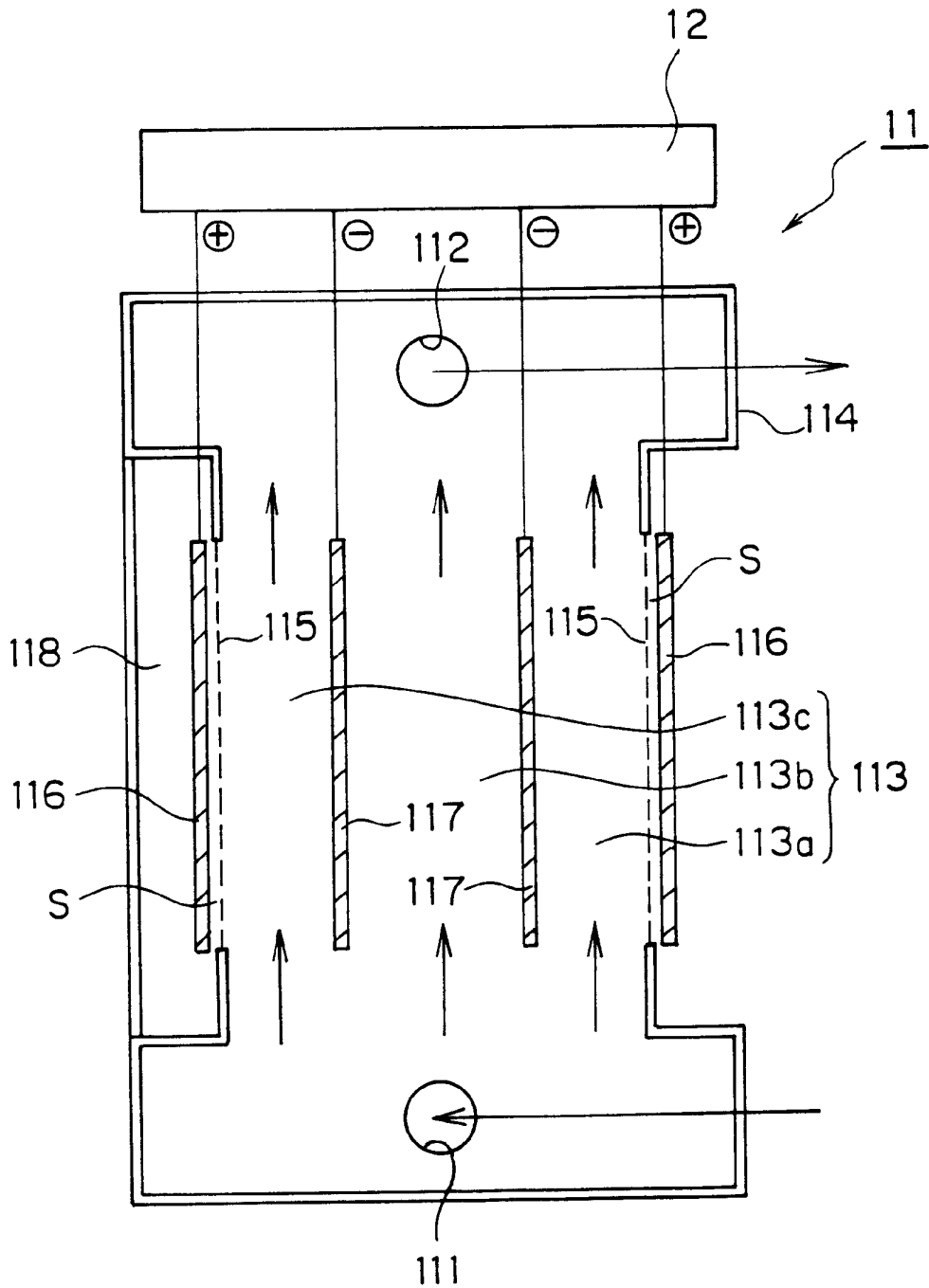
# FIG. 2



# FIG. 3



# 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.