

[54] **ULTRASONIC NEBULIZER**

[75] Inventors: **James R. Higson**, Santa Barbara;
David A. D'Alfonso, Goleta; **Robert R. Walls**, Santa Barbara, all of Calif.

[73] Assignee: **Mountain Medical Equipment, Inc.**,
 Denver, Colo.

[21] Appl. No.: **266,823**

[22] Filed: **Nov. 2, 1988**

3,828,773	8/1974	Buch et al.	239/102.2
3,861,386	1/1975	Harris et al.	128/194
3,866,831	2/1975	Denton	239/102.2
3,989,042	11/1976	Mitsui et al.	128/194
4,001,650	1/1977	Romain	317/41
4,094,317	6/1978	Wasnich	128/194
4,109,863	8/1978	Olson et al.	239/102
4,113,809	9/1978	Abair et al.	261/81
4,646,967	3/1987	Geithman	239/102.2

Primary Examiner—Randall L. Green
Assistant Examiner—K. M. Reichle
Attorney, Agent, or Firm—John E. Reilly

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 944,203, Dec. 22, 1986, abandoned.

[51] **Int. Cl.⁵** **A61M 11/00**

[52] **U.S. Cl.** **128/200.18; 128/200.16; 128/200.14; 238/107.1**

[58] **Field of Search** **128/200.14, 200.16, 128/200.18; 239/102.1, 102.2**

References Cited

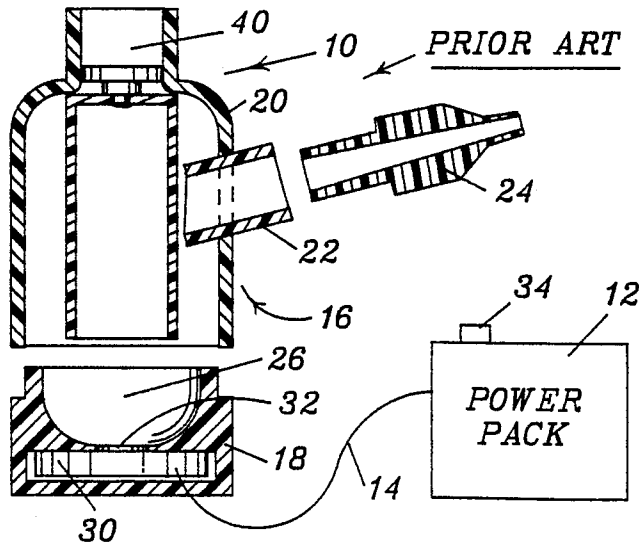
U.S. PATENT DOCUMENTS

3,433,461 3/1969 Scarpa 259/1
 3,774,602 11/1973 Edwards 128/194

[57] **ABSTRACT**

An ultrasonic nebulizer is of the type having a piezoelectric transducer communicating with a fluid reservoir and is characterized by having a protective cover of a predetermined wavelength which is superimposed on the transducer, an elastomeric boot in surrounding relation to the cover to prevent fluid loss from the interface between the cover and transducer, and an oil coupling medium is disposed in the interface for coupling the ultrasonic energy from the transducer to the cover.

10 Claims, 6 Drawing Sheets



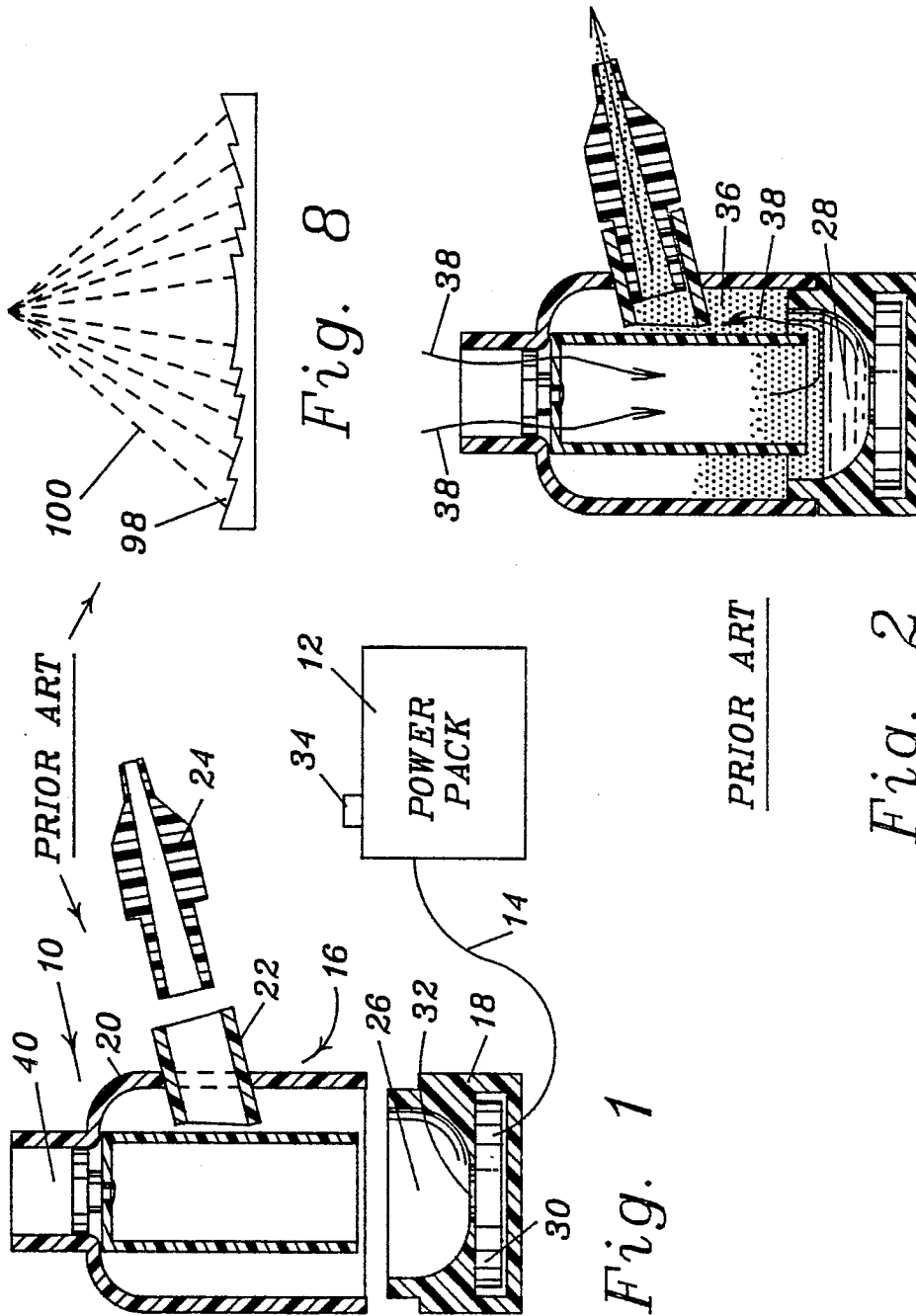


Fig. 8

Fig. 1

Fig. 2

PRIOR ART

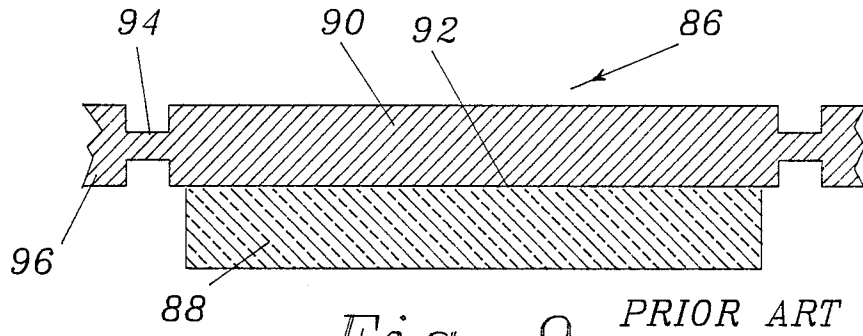


Fig. 9 PRIOR ART

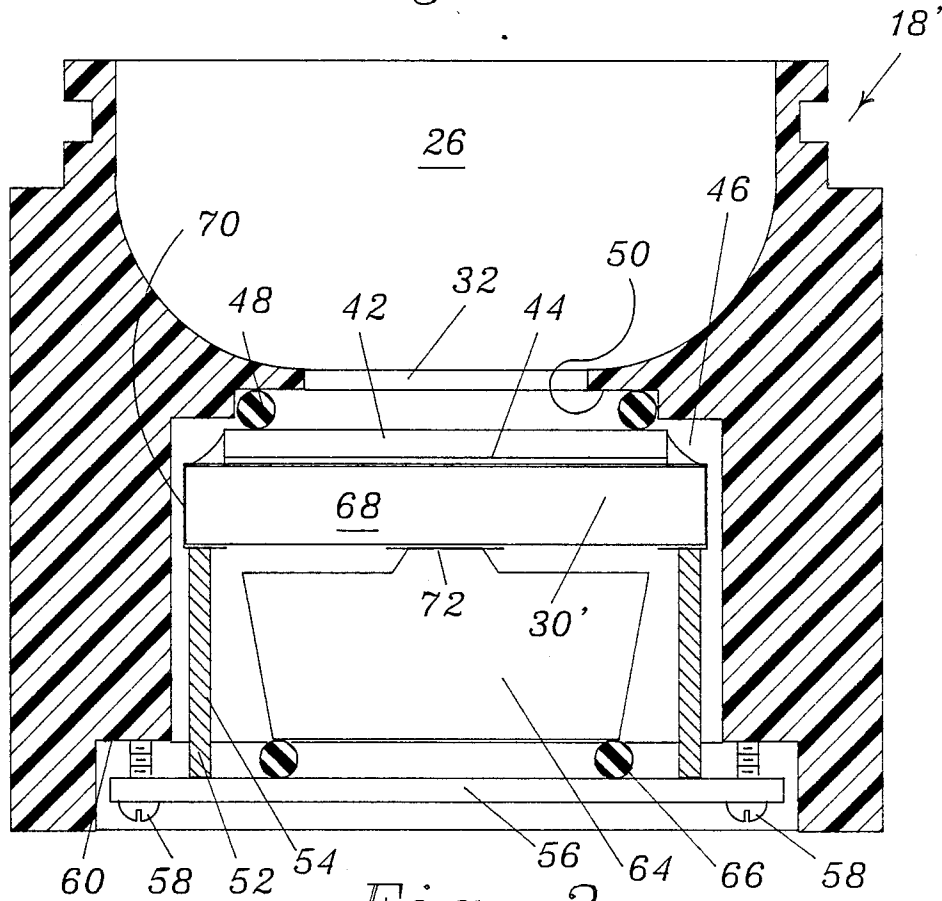


Fig. 3

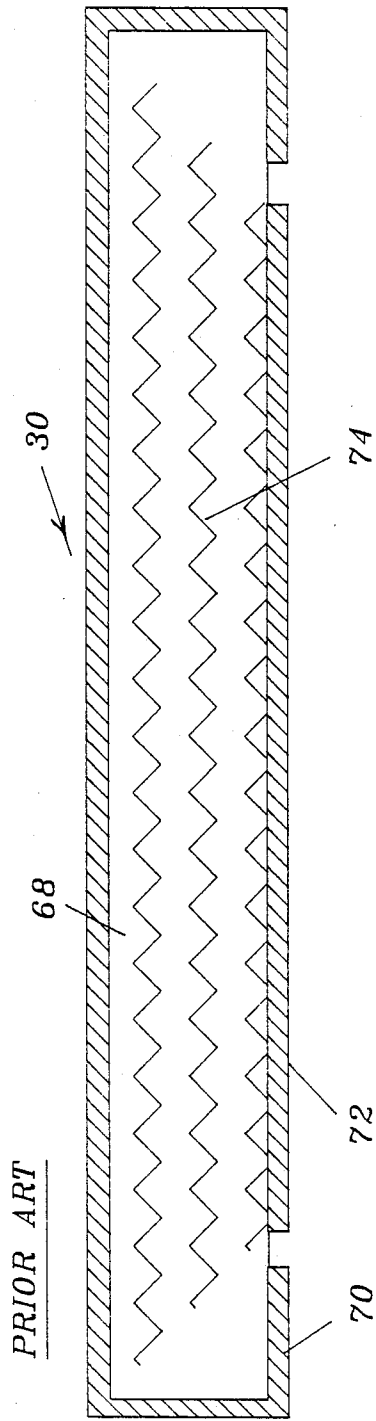


Fig. 4

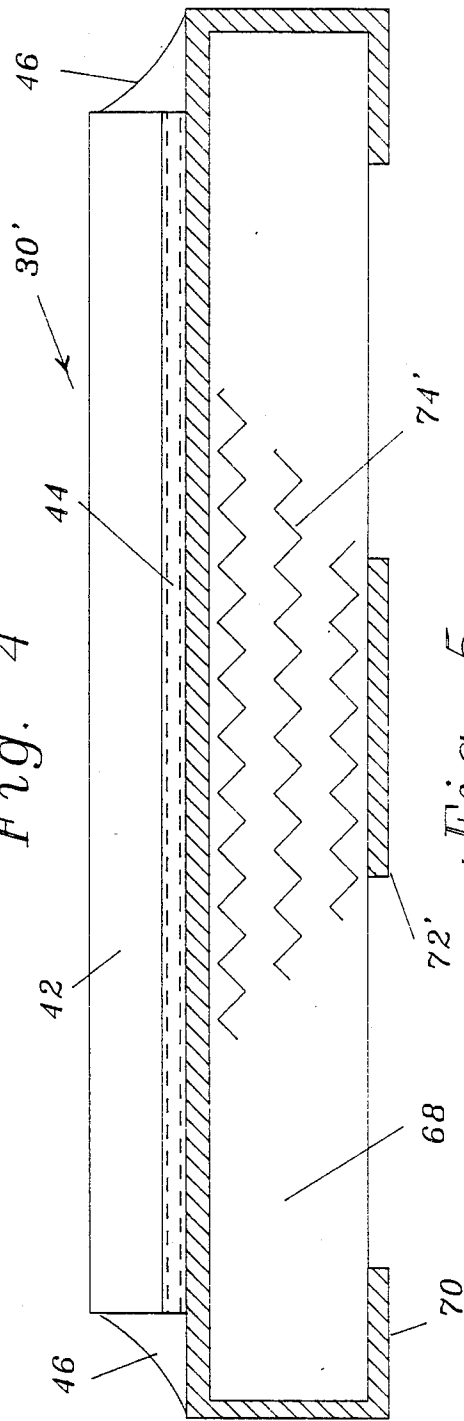


Fig. 5

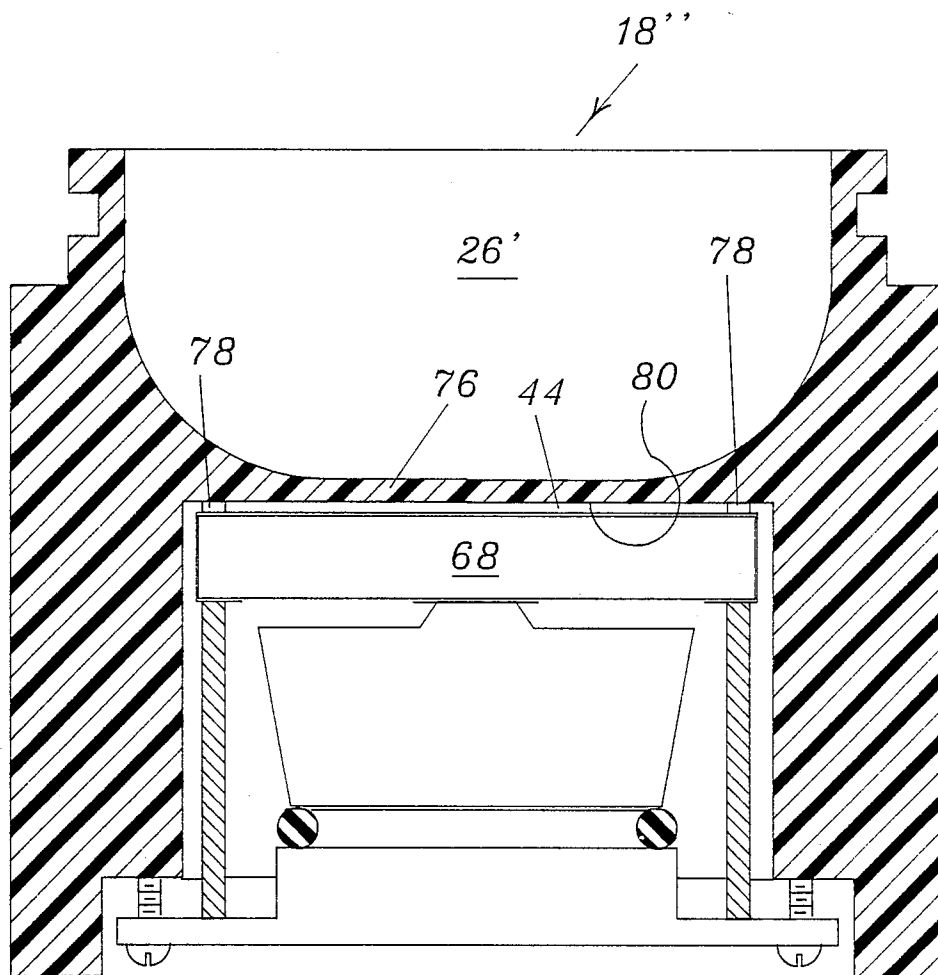


Fig. 6

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.