



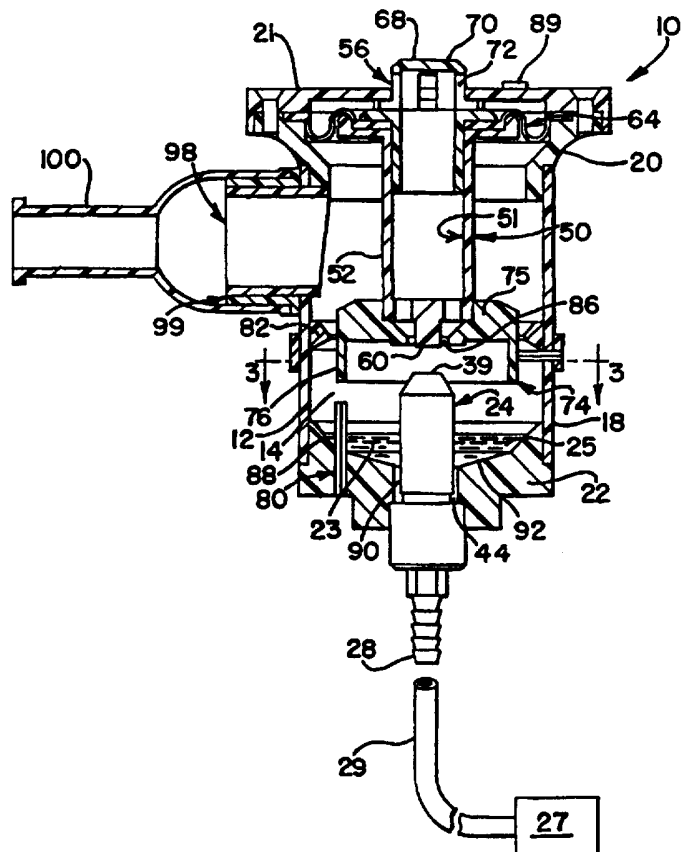
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>A61M 11/06</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 97/29799</b> (43) International Publication Date: 21 August 1997 (21.08.97)</p>
<p>(21) International Application Number: PCT/CA97/00096 (22) International Filing Date: 13 February 1997 (13.02.97) (30) Priority Data: 08/600,419 13 February 1996 (13.02.96) US (71) Applicant: TRUDELL MEDICAL LIMITED [CA/CA]; 926 Leathorne Street, London, Ontario N5Z 3M5 (CA). (72) Inventors: GRYCHOWSKI, Jerry, R.; 535 Waterford Drive, Lake Zurich, IL 60047 (US). BARAN, George; 233 Colette Drive, London, Ontario N6E 3S9 (CA). FOLEY, Martin, P.; 381 Grangeover Avenue, London, Ontario N6G 3V8 (CA). (74) Agents: MACLEAN, P., Scott et al.; Barrigar &amp; Moss, 7th floor, 81 Metcalfe Street, Ottawa, Ontario K1P 6K7 (CA).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 23 October 1997 (23.10.97)</p>

(54) Title: NEBULIZER APPARATUS AND METHOD

(57) Abstract

An apparatus and method for providing a nebula or aerosol to a patient. In one aspect, a nebulizer is pressure sensitive so that nebulization is coordinated with a breathing cycle of the patient. The nebulizer includes a movable gas diverter that diverts pressurized gas across a liquid outlet. The diverter is moved in response to the patient's breathing cycle. In one aspect, a biasing member moves the diverter. According to another aspect of the nebulizer, an annular liquid orifice disperses an aerosol in a radial direction in response to a pressurized gas flow from an orifice located concentrically thereto. Multiple liquid orifices may be provided. In a further aspect of the nebulizer, a reservoir includes an upper, wide portion and a lower narrow portion to apply relatively uniform pressure at a liquid orifice.



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# INTERNATIONAL SEARCH REPORT

Inter. Appl. Application No  
PCT/CA 97/00096

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61M11/06

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61M B05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	EP 0 711 609 A (AID MEDIC LTD) 15 May 1996  see column 3, line 20 - column 4, line 18 see column 5, line 33 - line 55 ---	1-3,5, 7-15,17, 26-28, 30-32, 52-55,57
X	GB 675 524 A (VERGNE) 9 July 1952  see page 2, line 11 - line 35; figure 2 ---	13,14, 17,26
X	US 5 165 392 A (SMALL JR JOHN C) 24 November 1992 see column 4, line 50 - column 5, line 25; figure 5  ---  -/--	26,52, 53,57

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- \*&\* document member of the same patent family

Date of the actual completion of the international search

9 June 1997

Date of mailing of the international search report

20.08.97

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

Inter. Patent Application No  
PCT/CA 97/00096

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 535 844 A (EMERSON) 26 December 1950 see claim 4; figures ---	13,17
X	US 3 630 196 A (BIRD FORREST M ET AL) 28 December 1971 see claim 1; figures 4,5 ---	13
A	US 5 054 477 A (TERADA TAKAO ET AL) 8 October 1991 see claims 3,6; figures 15-18 ---	14,26,52
A	FR 1 070 292 A (VINCENT ET AL.) 21 July 1954 -----	

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/CA 97/ 00096

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

SEE ANNEX

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-17, 26-32, 52-57

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/CA 97/ 00096

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

## MULTIPLE INVENTIONS

1. Claims: 1-17, 26-32, 52-57  
A nebulizer with breath or pressure actuated diverter.
2. Claims: 13, 18-25  
A cycled nebulizer connected to a ventilator.
3. Claims: 33-42  
A nebulizer with multiple nozzles.
4. Claims: 43  
A nebulizer with a ring baffle.
5. Claims: 44-48  
A nebulizer with an air outlet around the liquid outlet.
6. Claims: 49-51  
A nebulizer with a reservoir comprising superposed portions.
7. Claims: 58-65  
A cycled nebulizer coordinated with a physiological cycle.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Patent Application No

PCT/CA 97/00096

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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