



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification</b> <sup>6</sup> : <b>A61M 16/00, 11/06</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 96/40336</b> <b>(43) International Publication Date:</b> 19 December 1996 (19.12.96)
<b>(21) International Application Number:</b> PCT/US96/07958 <b>(22) International Filing Date:</b> 3 June 1996 (03.06.96) <b>(30) Priority Data:</b> 08/488,202      7 June 1995 (07.06.95)      US <b>(71) Applicant (for all designated States except US):</b> SALTER LABS [US/US]; 100 W. Sycamore Road, Arvin, CA 93203 (US). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> DAVENPORT, James, M. [US/US]; 1461 Sunset Grove Road, Fallbrook, CA 92028 (US). <b>(74) Agents:</b> BERKSTRESSER, Jerry, W. et al.; Shoemaker and Mattare, Ltd., Crystal Plaza Building 1, Suite 1203, 2001 Jefferson David Highway, Arlington, VA 22202-0286 (US).	<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, 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, US, UZ, VN, 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).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 30 January 1997 (30.01.97)	
<b>(54) Title:</b> PNEUMATICALLY-OPERATED GAS DEMAND APPARATUS		
<b>(57) Abstract</b>		
<p>A pneumatically-operated gas demand apparatus (10) coupled in interruptible fluid communication between a recipient (12) and a first source (312) of a pressurized first gas controls delivery of the first gas to the recipient (12) as the recipient (12) inhales and exhales and comprises a supply valve (28) and a sensing valve (30). The supply valve (28) has a first interior chamber (36) divided by a flexible first diaphragm (34) into a supply chamber region (38) and a control chamber region (40). The supply chamber region (38) is in interruptible fluid communication between the first source (312) of the first gas and the recipient (12). The control chamber region (40) is in continuous fluid communication with a second source (314) of a pressurized second gas. The sensing valve (30) has a second interior chamber (46) divided by a flexible second diaphragm (44) into a venting chamber region (48) and a sensing chamber region (50). The venting chamber region (48) is in interruptible fluid communication between the control chamber region (40) and an ambient air environment. The sensing chamber region (50) is in continuous fluid communication with the recipient (12). When the recipient (12) inhales, the second diaphragm (44) moves to a flow-causing position to cause the second gas to flow into the ambient air environment and causes the first diaphragm (34) to move to a flow-supplying position thereby delivering the first gas to the recipient (12). When the recipient (12) exhales, the second diaphragm (44) moves to a flow-stopping position to prevent the second gas to flow into the ambient air environment and causes the first diaphragm (34) to move to a flow-blocking position thereby preventing delivery of the first gas to the recipient (12).</p>		

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**INTERNATIONAL SEARCH REPORT**

International Application No  
**PCT/US 96/07958**

<p><b>A. CLASSIFICATION OF SUBJECT MATTER</b>                  IPC 6 A61M16/00 A61M11/06</p>				
<p>According to International Patent Classification (IPC) or to both national classification and IPC</p>				
<p><b>B. FIELDS SEARCHED</b></p>				
<p>Minimum documentation searched (classification system followed by classification symbols)                  IPC 6 A61M</p>				
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>				
<p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used)</p>				
<p><b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b></p>				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US,A,5 360 000 (CARTER WILLIAM) 1 November 1994 cited in the application see abstract; figures see column 3, line 32 - column 6, line 66 ---	1-5,15, 17-19, 21,22,26		
X	US,A,4 575 042 (GRIMLAND CHARLES J ET AL) 11 March 1986 see abstract; figures see column 2, line 10 - column 3, line 61 ---	1-5,21, 22 6-8,15, 23		
Y	FR,A,2 695 830 (PIERRE MEDICAL SA) 25 March 1994 see abstract; figures 1,3 see page 5, line 24 - page 8, line 21 --- -/--	6,7		
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.      <input checked="" type="checkbox"/> Patent family members are listed in annex.</p>				
<p>* Special categories of cited documents :</p> <table style="width:100%;"> <tr> <td style="width:50%;">                     "A" document defining the general state of the art which is not considered to be of particular relevance                      "E" earlier document but published on or after the international filing date                      "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)                      "O" document referring to an oral disclosure, use, exhibition or other means                      "P" document published prior to the international filing date but later than the priority date claimed                 </td> <td style="width:50%;">                     "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention                      "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone                      "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.                      "&amp;" document member of the same patent family                 </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family			
Date of the actual completion of the international search  <p align="center"><b>27 November 1996</b></p>		Date of mailing of the international search report  <p align="center"><b>04. 12. 96</b></p>		
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  <p align="center"><b>Zeinstra, H</b></p>		

**INTERNATIONAL SEARCH REPORT**

International Application No

PCT/US 96/07958

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A,4 686 974 (SATO TORU ET AL) 18 August 1987	8,15,23
A	cited in the application see abstract; figure 1	10
A	see column 6, line 49 - column 7, line 51 ---	
A	EP,A,0 285 470 (L'AIR LIQUIDE) 5 October 1988	9,16,24
A	see abstract; figures see column 2, line 32 - line 38 ---	
X	WILLIAM W. MUSHIN ET AL.: "Automatic Ventilation of the Lungs" 1980 , BLACKWELL SCIENTIFIC PUBLICATIONS , OXFORD LONDON EDINGURGH MELBOURNE XP002019573 166160	28-31
X	see page 404, line 11 - line 18 see page 405, line 1 - line 24; figure 24.17 ---	
A	US,A,4 396 015 (JOHNSON ROBERT J) 2 August 1983	28
A	see abstract; figures 1,2,4 see column 4, line 38 - column 5, line 28 ---	
A	US,A,4 986 269 (HAKKINEN TAISTO) 22 January 1991	28
A	see abstract; figures 1,4-7B see column 5, line 31 - column 9, line 50 ---	
A	US,A,4 706 664 (SNOOK JAMES A ET AL) 17 November 1987	28
A	see abstract; figure 19 see column 5, line 42 - column 8, line 16 -----	

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 96/07958

**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:

1. Claims: 1-27 a pneumatically-operated gas demand apparatus with a supply valve and a sensing valve
2. Claims: 28-31 an intermittent gas delivery device combined with a nebulizer

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.:

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

Information on patent family members

International Application No  
PCT/US 96/07958

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-5360000	01-11-94	NONE	
US-A-4575042	11-03-86	NONE	
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