FILE HISTORY US 6,006,748

PATENT:

6,006,748

INVENTORS: Hollis, Shane Douglas

TITLE:

Vent valve apparatus

NO:

APPLICATION US1997951357A

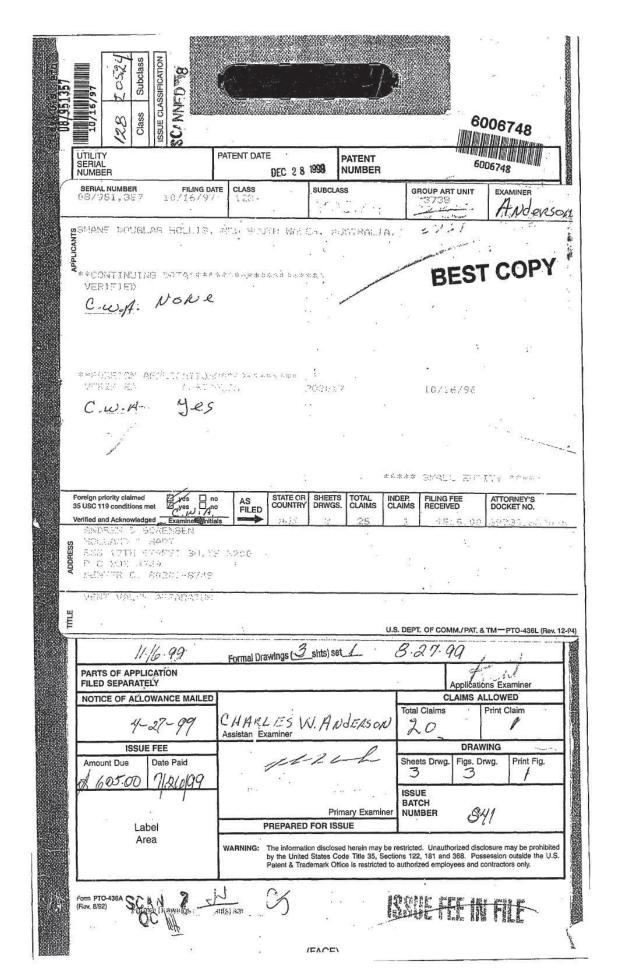
FILED: ISSUED: 16 OCT 1997 28 DEC 1999

COMPILED:

14 OCT 2015

1

RMD 1011



6,006,748

VENT VALVE APPARATUS

Transaction History

Date	Transaction Description
11-06-1997	Initial Exam Team nn
01-22-1998	IFW Scan & PACR Auto Security Review
02-09-1998	Notice MailedApplication IncompleteFiling Date Assigned
04-09-1998	Request for Foreign Priority (Priority Papers May Be Included)
04-21-1998	Application Is Now Complete
04-27-1998	Application Dispatched from OIPE
05-13-1998	Information Disclosure Statement (IDS) Filed
05-13-1998	Information Disclosure Statement (IDS) Filed
05-22-1998	Case Docketed to Examiner in GAU
07-27-1998	Information Disclosure Statement (IDS) Filed
07-27-1998	Information Disclosure Statement (IDS) Filed
08-31-1998	Non-Final Rejection
09-16-1998	Mail Non-Final Rejection
11-25-1998	Information Disclosure Statement (IDS) Filed
11-25-1998	Information Disclosure Statement (IDS) Filed
01-25-1999	Information Disclosure Statement (IDS) Filed
01-25-1999	Information Disclosure Statement (IDS) Filed
02-16-1999	Response after Non-Final Action
02-16-1999	Request for Extension of Time - Granted
03-16-1999	Date Forwarded to Examiner
03-31-1999	Case Docketed to Examiner in GAU
04-21-1999	Workflow - Incoming Correspondence - Finish
04-21-1999	Workflow - Incoming Correspondence - Begin
04-27-1999	Mail Notice of Allowance
04-27-1999	Notice of Allowance Data Verification Completed
06-11-1999	Workflow - File Sent to Contractor
07-26-1999	Issue Fee Payment Verified
07-26-1999	Miscellaneous Incoming Letter
07-26-1999	Workflow - Incoming Correspondence - Finish
07-26-1999	Workflow - Incoming Correspondence - Begin
07-26-1999	UnMatched Papers in Pubs
08-27-1999	Workflow - Drawings Finished
08-27-1999	Workflow - Drawings Matched with File at Contractor
08-27-1999	Workflow - Drawings Received at Contractor
08-27-1999	New or Additional Drawing Filed
10-29-1999	Mail Examiner's Amendment
10-29-1999	Examiner's Amendment Communication
11-16-1999	Workflow - Complete WF Records for Drawings
12-12-1999	Application Is Considered Ready for Issue
12-17-1999	Issue Notification Mailed
12-17-1999	Issue Notification Mailed
12-17-1999	Recordation of Patent Grant Mailed
07-06-2000	Change in Power of Attorney (May Include Associate POA)
07-06-2000	Correspondence Address Change
07-06-2000	Change in Power of Attorney (May Include Associate POA)
07-06-2000	ENTITY STATUS SET TO UNDISCOUNTED (INITIAL DEFAULT SETTING
	OR STATUS CHANGE)
01-10-2008	Correspondence Address Change

			*
	71594 U.S. 710 00/951367	PATENT APPLICATION	APPROVED FOR LICENSE
	10716/97	08951357	The second secon
	Date Entered or Counted	CONTENTS	Date Received or Mailed
			2
		Application papers.	a dag.
	2.	LIKE Ge, Ne	100/01
	3. 4.	Di miti Or for	4141415 44-9V
	5.	2.D.S!	15-13-98
1	8 31 P 6.	Rej - 3ms	9/140/18
	7.	Suppl himlet	27-98
	8.	Suppl thou and	11-25-98
	9.	9/14/2000	1.28-99
,	10.	and a	12-16-99
	7-26 12.	Notice of Allow	4-27-99
	13.	Letter Le: IDS	7-26-99
	14.		<u> </u>
	10/29 16.	1 200 00 1 1 1 1 10	8-21-77
		supply Tille of Hilland	10-29-97
V.	18.		
>	19.		
			-
		<u></u>	-
	ANGERS - 18 - 18 - 18 - 18 - 18 - 18 - 18 - 1		· · · · · · · · ·
		:	
	26.		
			- 4
			*
	8		
•			3
		(FRONT)	

	/28	0	CLASS 2 05.2	12-	
PPLICATION SERIAL NUMBER		CRO	SS REFERENC	E(S)	× .
08/95/357	CLASS	. 1	SUBCL (ONE SUBCLAS	ASS S PER BLOCK)	. *
SHANE D. HOLLIS	123	204.18	204,23		
,	137	115:16	908		
REISSUE, ORIGINAL PATENT NUMBER	-	1			1.
HEISSUE, UNIGUAL PATENT NUMBER		8	:2	1990	
INTERNATIONAL CLASSIFICATION	Jan 15	. 1			
1111-1-9/09	٠.		i /		
 / / / ° 	=- :	1,70			11
	GROUP AS	HARLE	S W. AA	DERSE	AME)
	376/1	IMARY EXAMINER	PLEASE STAMP OR	PRINT FULL NAM	(E)

 POSITION
 ID NO.
 DATE

 CLASSIFIER
 16
 1-9-9%

 EXAMINER
 4
 3

 TYPIST
 4
 3

 VERIFIER
 4
 3

 CORPS CORR.
 4
 4

 SPEC. HAND
 7
 7

 FILE MAINT.
 DRAFTING
 4

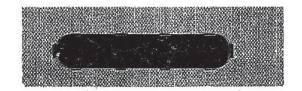
INDEX OF CLAIMS

Cl	aim	1	0,0	1	Dat	е			
-	723	X	130	-	- Jul		-		
78	Original	3	M	`		- 8			
Final	ig	2	17			- 8		1 3	
	Ō	1	\times			- 5			
10		17	-	-				-	
-	1	V	-	_				-	_
_		-	_	_	_			_	
	3,	V	Ü.,					-	
	A	D		10			w		
9	5	0		$\overline{}$	-	1			_
	6		75		٠,	5	-	-	_
3	ь	V	Z	_	1				
4	2	i	=	j	1				
5	3	2	-	1					
-	10	V	7	-					
-	40	0	-			-		-	
6	11	D	-		one			an i	
17	12	0	-						
2	13	0	=	-	-	-		_	
2	10	-	-	_	-	-	-	-	_
4	14 15 (16)	000	-						
00	15	0	=	1	11,000		A		
13	(16)	0	=						
14	17	0	Ξ	-	-		-	-	_
7		2		_	_	_		_	_
15	18	0	=	-					
16	19	0	Z				88		
007	20	V	_		-				
1	20	0	=	_	_	_	_	_	
8	21	0	=				1000		
11	(22)	0	7 7			10.3652			
	23	0	=						
	24	0	=	-	-	-	-	-	_
19	24	-	=	-	_	_		-	2300
50	25	D	=						
	26								
	27								
	28	_		-			-	-	-
	-	-	-	-	-	-	_		
	29				_			_	
	30								
	31								
	32					-	100		
		-	-			-		-	-
	33		_				_		_
	34								2177
	35			-		000			
3.0	36								
-		-		-		-	-		
_	37	-	-	-	-	-	-	-	-
	38								
	39								
	40								
-	_		-		-	-	_	-	-
_	41	_	_					_	
	42								
	43								
-	44	1	1	-	—	-			-
_		-	-	-	-	-	-		_
	45				_	_			
	46			1					
	47		1					1	
-	48	-	+-		1			1	
_			_	-		-	-	_	_
	49			1					
_	50	1	1		1		1		1

SYMBOLS	
	Rejected
	. Allowed
(Through numberal)	Canceled
	. Restricted
	. Non-elected
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	. Intérference
	. Appeal
	. Objected

Final	Original								
	51								
	52	_					700		
	53				-	-		-	
-	54	-	_	-	-		1		-
0	55	_	-	\vdash	-			0	-
	56	_	-	_	-	-			
_			_	_		- 2	-		
	57							_	
	58								
	59								
	60								
	61	10000				3	- 25		
	62		1000						1000
	63								
	64		1						
	65	- 5							- 77
	66		17.50	1100		-			
	67								
- %	68						_		
	69					-	-	3000	
-	-		-	-	-	-		-	-
	70	_	-	_	-		_	_	_
3	71	_	_						
_	72	_	_						
100	73								
_	74								
	75				22010				
	76								
	77								-332
	78	200							
	79								
	80	1							
	81				2527.0				
	82							1000	
	83						27 . 1/1		
_	84		1		\vdash		_	-	
Ž.	85				\vdash	-			
	86					1000	0.00	1	
-	87						-	_	1
-	88	-	-		1		1	1	1
	89		-				\vdash	+	-
-	90		-	1	-	1		-	+
-	-	-	1	\vdash	-	-	-	-	-
_	91		-	-	-		-	-	-
_	92	_	_	-	-	-	-	-	-
	93			_	-	_	_	_	-
	94	_			-	-		1	1
_	95		1	_			1		
	96			_		-		1	-
	97							1	
П	98	50.0				Sacr		N. Co	
	99			Г					
	100		1	1	1	T	1		

(LEFT INSIDE)



	SEAR	CHED	
Class	Sub.	Date	Exmr.
128 128 128 128 128	205.24 204.78 204.27 204.26 205.11 205.13 202.28	800	C.w. p.
ufde	nte 30	-h	C.c.A.
137 137	115.14 908	4/13/90	

Class	Sub.	Date	Exmr.
128	205,24 204.18	4/9/9	C.W.A.
128 137 137	115,16 908	4/13/	C.w.
~		179	

Pring far 4/	Vinne fan 11/	SEARCH N	OTES	
		contactor will chn RI U. 2.11 Pring for iponshihea work in 137/115714	Date #/12/94	Exmr.
		. 1700		

(RIGHT OUTSIDE)

	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	11876	128/200.11-207.18.ccls.	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM TDB	2001/06/28 17:09
2	BRS	L2	986	1 and vent	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM TDB	2001/06/28 17:10
3	BRS	L3	323	2 and diaphragm	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM TDB	2001/06/28 17:10
4	BRS	L4	311	3 and pressure	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM	2001/06/28 17:11
5	BRS	L5	300	4 and flow	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM	2001/06/28 17:23

06/28/2001, EAST Version: 1.02.0008

	Comments	Error Definition	Err ors
1	E	(E)	0
2			0
3			0
4			O
5	*		O .

06/28/2001, EAST Version: 1.02.0008

	Type	L	#	Hits	Search Text	DBs	Time Stamp
6	BRS	L6	12	11	gas adj washout and vent	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM TDB	2001/06/28 17:44
7	BRS	ь7		112036	valve and high adj pressure		2001/06/28 17:46
8	BRS	L8		13519	7 and vent		2001/06/28 17:46
9	BRS	ГЭ		12149	8 and flow	USPAT; US-PGP UB; EPO; JPO; DERWEN T; IBM TDB	2001/06/28 17:47
10	BRS	L1()	851279	9 regulat\$\$\$	USPAT; US-PGP UB'; EPO; JPO; DERWEN T; IBM	2001/06/28 17:48

06/28/2001, EAST Version: 1.02.0008

	Comments	Error Definition	Err ors
6		8	0
7			0
8			0
9			0
10			0

06/28/2001, EAST Version: 1.02.0008

鄉

PALM INTRANET

Day: Monday Date: 6/25/2001 Time: 17:41:54

Application Number Information

Application Number:

08/951357 <u>Assignments</u> Filing Date: 10/16/1997

W

Group Art Unit: 3761 Class/Subclass:

Application Received: 10/16/1997

128/205.240

Patent Number : <u>6006748</u>

Lost Case : NO

Issue Date : 12/28/1999

Interference Number :

Unmatched Petition: NO

Date of Abandonment: 00/00/0000 Attorney Docket Number: 38730.830026

L&R Code: 01

Status: 150 / PATENTED FILE

Status Date: 12/16/1999

Location Date:

Examiner Number: 72385/ANDERSON, CHARLES

Location: 9200/FILE REPOSITORY (FRANCONIA)

06/22/2001

Charge to Location: 3761/TECH CENTER 3700 - GROUP ART UNIT 3761

Charge to Name : SRIVASTAVA, VIRENDRA K

Title of Invention:

VENT VALVE APPARATUS

Search Another: Application#

Appln Contents Details Atty/Agent Info Continuity Data Foreign Data Inventors

Info

Search

or Patent#

(To Go BACK Use BACK Button on Your BROWSER Tool Bar)

Back to || PALM || ASSIGNMENT || OASIS || Home Page

l of l

6/25/01 5:41 PM



US006006748A

United States Patent [19]

Hol	lis	
[54]	VENT VALVE APPARATUS	

[54]	1 23112 12	is vis / it i / it i i i i i i i i i i i i i i	
[75]	Inventor:	Shane Douglas Hollis, Denistone,	

Australia

[73] Assignee: ResMed Limited, North Ryde,
Australia

[21] Appl. No.: 08/951,357

[22] Filed: Oct. 16, 1997

[30] Foreign Application Priority Data

[56] References Cited

U.S. PATENT DOCUMENTS

Re. 35,295	7/1996	Estes et al
Re. 35,339	10/1996	Rapoport .
D. 188,084	5/1960	Garelick .
D. 231,803	6/1974	Huddy .
D. 250,131	10/1978	Lewis et al
D. 262,322	12/1981	Mizerak .
D. 293,613	1/1988	Wingler .
D. 310,431	9/1990	Bellm .
D. 334,633	4/1993	Rudolph .
D. 262,322D. 293,613D. 310,431	12/1981 1/1988 9/1990	Mizerak . Wingler . Bellm .

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

A-62221/90	3/1991	Australia .
91/77110	11/1991	Australia .
A-33877/93	4/1993	Australia .
B-59270/90	5/1993	Australia .
A-38508/93	7/1993	Australia .
A-48748/93	9/1993	Australia .
A-52628/93	7/1994	Australia .
94/64816	12/1994	Australia .
95/16178	7/1995	Australia .
9459430	2/1996	Australia .

[11] Patent Number: 6,006,748 [45] Date of Patent: Dec. 28, 1999

A 32914/95	2/1996	Australia .
A-34471/95	2/1996	Australia .
A-40711/95	4/1996	Australia .
B 34354/95	5/1996	Australia .
A 39130/95	6/1996	Australia .
A 42027/97	2/1998	Australia .
A 41018/97	4/1998	Australia .
1039144	9/1978	Canada .
0 236 850 A2	9/1987	European Pat. Off.

(List continued on next page.)

OTHER PUBLICATIONS

New! Breas PV 100 CPAP First Class Quality and Function. At the right Price; Jul. 4, 1998, pp. 1–2. PV 101 Bi Level CPAP and PV 102 Bi–Level Time; pp. 1–3. Prodigy Medical Supplies Co. Ltd.; CPAP. Puritan Bennett; Companion 318 Nasal CPAP System; May 1993. Nellcor Puritan Bennett; Announcing the Goodnight 314 and GoodKnight 318 Nasal CPAP Systems. Puritan Bennett; Clean, Quiet, and Comfortable . . . The Companion's 515 Nasal CPAP System; Jun. 1988. Devilbiss Night Guard Nasal CPAP for the Treatment of Obstructive Sleep Apnea.

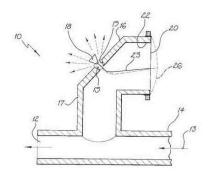
(List continued on next page.)

Primary Examiner—John G. Weiss Assistant Examiner—Charles W. Anderson Attorney, Agent, or Firm—Holland & Hart LLP

[57] ABSTRACT

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22, 23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO_2 gas through the washout vent (15) over a range of gas supply pressures.

20 Claims, 3 Drawing Sheets



6,006,748 Page 2

	U.S. PA	TENT DOCUMENTS			Sullivan .
D. 362,061	0/1005	McGinnis et al	4,957,107	9/1990	1000 A
D. 377,089	12/1996	Starr et al	4,971,051	11/1990	
1,926,027	9/1933	Biggs .	4,989,599	2/1991	Carter .
2,123,353	7/1938		5,005,568	4/1991	Loescher et al
2,248,477	7/1941		5,005,571 5,009,635	4/1991 4/1991	
2,254,854	9/1941		5,024,219	6/1991	Scarberry . Dietz .
2,317,608		Heidbrink .	5,038,776	8/1991	
2,371,965	3/1945	Lehmberg .	5,042,473	8/1991	Lewis .
2,438,058	3/1948	Kincheloe .	5,042,478	8/1991	Kopala et al
2,931,356	4/1960	Schwarz.	5,046,200	9/1991	Feder .
2,939,458	6/1960	Lundquist .	5,065,756	11/1991	Rapoport .
3,013,556	12/1961	Galleher.	5,069,205	12/1991	Urso .
3,189,027	6/1965	Bartlett .	5,105,354	4/1992	Nishimura .
3,238,943	3/1966	Holley .	5,109,840	5/1992	Daleiden .
3,315,674	4/1967	Bloom et al	5,117,819	6/1992	Servidio et al
3,330,273	7/1967	Bennett .	5,121,745	6/1992	Israel . Huennebeck .
3,362,420 3,363,833	1/1968 1/1968	Blackburn et al Laerdal .	5,133,347 5,134,995	7/1992 8/1992	Gruenke et al
3,556,122	1/1971	Laerdal .	5,140,982	8/1992	Bauman .
3,580,051	5/1971	Blevins .	5,148,802	9/1992	Sanders et al
3,700,000	10/1972	Hesse et al	5,161,525	11/1992	Kimm et al
3,783,893	1/1974	Davison .	5,183,983	2/1993	Knop.
3,796,216	3/1974	Schwarz.	5,199,424	4/1993	Sullivan et al
3,903,875	9/1975	Hughes .	5,203,343	4/1993	Axe et al
3,932,054	1/1976	McKelvey .	5,231,979	8/1993	Rose et al
3,985,467	10/1976	Lefferson .	5,239,995	8/1993	Estes et al
3,992,598	11/1976	Welsh et al Elam .	5,243,971	9/1993	Sullivan et al
4,077,404 4,167,185	3/1978 9/1979	Lewis .	5,245,995 5,259,373	9/1993 11/1993	Sullivan et al Gruenke et al
4,226,234	10/1980	Gunderson .	5,265,595	11/1993	Rudolph .
4,245,632	1/1981	Houston .	5,271,391	12/1993	Graves .
4,249,527	2/1981	Ko et al	5,279,289	1/1994	Kirk .
4,301,833	11/1981	Donald, III .	5,293,864	3/1994	McFadden .
4,304,229	12/1981	Curtin .	5,305,787	4/1994	Thygesen .
4,328,797	5/1982	Rollins, III et al	5,313,937	5/1994	Zdrojkowski .
4,347,205	8/1982	Stewart .	5,335,654	8/1994	Rapoport .
4,354,488	10/1982	Bartos .	5,343,878	9/1994	Scarberry et al
4,387,722	6/1983 9/1983	Kearns . Gadberry .	5,353,788	10/1994 10/1994	Miles . Ratner .
4,402,316 4,412,537	11/1983	Tiger .	5,357,951 5,419,318	5/1995	Tayebi .
4,448,058	5/1984	Jaffe et al	5,429,126	7/1995	Bracken .
4,467,799	8/1984	Steinberg .	5,429,683	7/1995	Le Mitouard .
4,499,914	2/1985	Schebler .	5,431,158	7/1995	Tirotta .
4,522,639	6/1985	Ansite et al	5,433,193	7/1995	Sanders et al
4,530,334	7/1985	Pagdin .	5,438,981	8/1995	Starr et al
4,616,647	10/1986	McCreadie .	5,441,046	8/1995	Starr et al
4,622,964	11/1986	Flynn.	5,443,061	8/1995	Champain et al
4,655,213	4/1987	Rapoport et al	5,458,137	10/1995	Axe et al
4,665,570	5/1987 6/1987	Davis . Bishop et al	5,477,852 5,488,948	12/1995 2/1996	Landis et al Dubruille et al
4,671,271 4,677,977	7/1987	Wilcox .	5,490,502	2/1996	Rapoport et al
4,686,974	8/1987	Sato et al	5,492,113	2/1996	Estes et al
4,770,169	9/1988	Schmoegner et al	5,492,116	2/1996	Scarberry et al
4,774,941	10/1988	Cook .	5,501,214	3/1996	Sabo .
4,782,832	11/1988	Trimble et al	5,503,146	4/1996	Froehlich et al
4,795,314	1/1989	Prybella et al	5,517,983	5/1996	Deighan et al
4,809,692	3/1989	Nowacki et al	5,517,986	5/1996	Starr et al
4,821,713	4/1989	Bauman .	5,522,382	6/1996	Sullivan et al
4,827,922	5/1989	Champain et al	5,535,738	7/1996	Estes et al
4,838,258	6/1989	Dryden et al	5,535,739	7/1996	Rapoport et al
4,841,953 4,848,334	6/1989 7/1989	Dodrill . Bellm .	5,537,997 5,540,219	7/1996 7/1996	Mechlenburg et al Mechlenburg et al
4,848,366	7/1989	Aita et al	5,540,220	7/1996	Gropper .
4,870,960	10/1989	Hradek .	5,540,223	7/1996	Starr et al
4,870,963	10/1989	Carter .	5,542,128	8/1996	Lomas .
4,907,584	3/1990	McGinnis .	5,546,933	8/1996	Rapoport et al
4,910,806	3/1990	Baker et al	5,551,418	9/1996	Estes et al
4,913,401	4/1990	Handke .	5,551,419	9/1996	Froehlich et al
4,919,128	4/1990		5,560,354	10/1996	Berthon-Jones et al.
4,938,212	//1990	Snook et al	5,570,682	11/1996	Johnson .

6,006,748

Page 3

```
5,570,689 11/1996 Starr et al.
5,592,938 1/1997 Scarberry e
5,598,838 2/1997 Servidio et
                                                                          WO 97/10868
WO 97/15343
                                                                                            3/1997
5/1997
                                                                                                      WIPO
                          Scarberry et al.
                                                                                                      WIPO .
                          Servidio et al. .
                                                                          WO 97/28838
                                                                                            8/1997
                                                                                                      WIPO
    5,617,846
                  4/1997
                          Graetz et al. .
                                                                          WO 97/41812
                                                                                           11/1997
                                                                                                      WIPO
    5.632.269
                  5/1997
                          Zdrojkowski .
Remmers et al.
                                                                          WO 97/41911
                                                                                           11/1997
                                                                                                      WIPO
                  7/1997
7/1997
                                                                          WO 98/04310
WO 98/06449
    5,645,053
                                                                                            2/1998
    5,645,054
                          Cotner et al. .
                                                                                            2/1998
                                                                                                      WIPO
    5,647,355
5,647,357
                  7/1997
7/1997
                          Starr et al.
                                                                          WO 98/11930
WO 98/18514
                                                                                            3/1998
5/1998
                                                                                                      WIPO .
                          Barnett et al.
                          Mechlenburg et al.
Scarberry et al. .
                                                                                            6/1998
6/1998
    5 655 522
                  8/1997
                                                                          WO 98/24499
                                                                                                      WIPO
    5,655,527
                  8/1997
                                                                          WO 98/25662
                                                                                                      WIPO .
    5,657,752
                  8/1997 Landis et al. .
                                                                          WO 98/26829
                                                                                            6/1998
                                                                                                      WIPO .
    5,662,101
                  9/1997
                          Ogden et al.
                                                                                            6/1998
                          Langenback .
Ogden .
Zdrojkowski et al. ...... 128/205.24
                  9/1997
                                                                                                     WIPO .
    5.666.946
                                                                          WO 98/33433
                                                                                            8/1998
    5,682,878
5,685,296
                11/1997
11/1997
                                                                                            OTHER PUBLICATIONS
    5,687,715
5,701,883
                11/1997 Landis et al. .
12/1997 Hete et al. .
                                                                          Sunrise; DeVilbiss Horizon LT 8001 Nasal CPAP Therapy
                                                                         Small in Size, big on features; Aug. 1997.
    5,704,345
                 1/1998 Berthon-Jones
2/1998 Deighan et al.
                                                                         Devilbiss; Revitalizer Soft Start; The Facts Speak for Them-
     5,715,812
                          Deighan et al. .
                                                                         selves, 1992.
    5.715.814
                 2/1998
                          Ebers
                 3/1998 Hawkins
4/1998 Brydon .
    5,730,121
                                                                          Tranquility; Performance CPAP Advantage
    5,740,795
                                                                         Healthdyne International; Tranquility Plus
    5,746,201
                 5/1998 Kidd .
                                                                          Respironics Inc.; Respironics' Solo CPAP System Provides
                                                                          Simplified OSA Therapy at an Outstanding value; Sep. 19,
           FOREIGN PATENT DOCUMENTS
                                                                         1996
                           European Pat. Off. .
0 839 545 A1
                  5/1998
                                                                         Respironics Inc.; The First Family of OSA Therapy; 1991.
2 672 221 A1
                 8/1992
                           France
                                                                          Fisher & Paykel Healthcare; HC200 Series Nasal CPAP
     467041
1395391
                  5/1992
                            Sweden
                                                                         Blower & Heated Humidifier.
                  5/1975
                            United Kingdom
                                                                         Pierre Medical; Morphee Plus appareil de traitment des
   1432571
1 444 053
                 4/1976
7/1976
                           United Kingdom .
United Kingdom .
                                                                         apnees du sommeil manuel d'utilisation.
                                                                          Weinmann: Hamburg; Somnotron nCPAP-Great WM 2300,
   1 467 828
2 077 444
                3/1977
12/1981
                           United Kingdom
United Kingdom
                                                                         Nov. 1991.
                                                                          Puritan Bennett; 515a Part of Our Blueprint for the Future;
     2145335
                 3/1985
5/1985
                           United Kingdom
United Kingdom
    2 147 506
                                                                          Mar. 1990.
    2 164 569
                 3/1986
                            United Kingdom
                                                                         Puritan Bennett; Companion 320 I/E Bi-Level Respiratory
   2 205 167
2 254 700
                11/1988
10/1992
                            United Kingdom
                                                                         System; Apr. 1993.
                            United Kingdom
                                                                          ResMed; Sullivan VPAP II & II ST
   2 267 648
2 294 400
                12/1993
5/1996
                           United Kingdom .
United Kingdom .
                                                                         ResMed; The Sullivan V Family of CPAP Systems; 1996.
ResMed; The AutoSet Portable II; 1997.
WO 80/01044
                 5/1980
                            WIPO
                                                                          ResMed; Sullivan Nasal CPAP System.
WO 82/03326
                 10/1982
                            WIPO
                                                                         ResMed; The Sullivan IIID; 1995.
WO 82/03548
                10/1982
                            WIPO
                                                                         ResMed; The Sullivan Comfort; 1996.
DeVilbiss a Division of Sunrise Medical; Expand your
WO 86/05965
WO 86/06969
                10/1986
                            WIPO
                12/1986
                            WIPO
WO 87/01950
WO 88/10108
                4/1987
12/1988
                            WIPO
                                                                         Horizons With The Horizons; 1995.
                            WIPO
                                                                         Healthdyne Technologies; Home Health Care Dealer; The
WO 90/14121
                11/1990
                            WIPO
                                                                         Journal of Home Medical Equipment and Services/Supplier;
WO 91/03277
                  3/1991
                            WIPO
                                                                          Nov. and Dec. 1997.
                                                                         Healthdyne International; Tranquility Quest, The Compact CPAP for Greater patient comfort.

AirStep; Medical Products . . . Stand the Test of Time.

MAP Medical Progress for Physician und Patient; The
WO 92/11054
                  7/1992
                            WIPO
                 9/1992
WO 92/15353
WO 92/20395
                            WIPO
                11/1992
                            WIPO
                12/1992
2/1993
5/1993
                           WIPO
WIPO
WO 92/22244
WO 93/01854
WO 93/08857
                            WIPO
                                                                         Gentle Therapy for Sleep-Related Breathing Disorders. Taema; Ventilation CP 90.
WO 93/21982
                11/1993
                            WIPO
WO 93/24169
                12/1993
                            WIPO
                                                                         DPAP; Breath, by breath, by breath.
WO 94/02190
WO 94/16759
                 2/1994
8/1994
                                                                         Lifecare; Smallest. Quietest. Smartest.
                            WIPO
                                                                         Lifecare; Quiet CPAP System for Maximum Compliance;
WO 94/20051
WO 94/23780
                9/1994
10/1994
                           WIPO
WIPO
                                                                         1991.
                                                                         Lifecare; Software Nasal Mask, Custom Nasal Masks; 1991.
WO 95/02428
                 1/1995
                            WIPO
WO 95/32016
                11/1995
                            WIPO
                                                                          Nidek Medical; Silenzio
WO 96/16688
                 6/1996
                            WIPO
                                                                          Weinmann; Just to Fell Well, Sensitive Sleep Apnea Therapy
WO 96/17643
                  6/1996
                            WIPO
                                                                         with Somnotron 3 and Somno-Mask System
WO 96/25983
                 8/1996
                            WIPO
                                                                         Respironics Inc.; Aria CPAP System; 1993.
WO 96/39206
WO 96/40337
                12/1996
12/1996
                           WIPO .
                                                                         Respironics Inc.; SleepEasy III A New Dawn in Patient
                                                                          Compliance.
WO 97/02064
                  1/1997
                            WIPO
                                                                         Respironics Inc.; Muliple Choice REMstar Choice Nasal CPAP System.
WO 97/07847
                  3/1997
WO 97/10019
                 3/1997
                            WIPO
```

6,006,748

Page 4

MaxII nCPAP and Moritz II Bi-Level Brochure.

Mask 1 Photographs, Respironics Inc., Reusable Full Mask (small) Part # 452033 Lot #951108.

Mask 2 Photographs, Puritan—Bennett, Adam Curcuit , Shell Part # 231700, Swivel Part # 616329–00, Pillows (medium) Part #616324.

Mask 3, Photographs, DeVilbiss Healthcare Inc., DeVilbiss

Seal-Ring and CPAP Mask Kit (medium), Part 73510-669. Mask 4 Photographs, Respironics Inc., Monarch Mini Mask with Pressure Port. Part # 572004, Monarch Headgear, Part

Mask 5 Photographs, Healthdyne Technologies, Nasal CPAP Mask (medium narrow), Part # 702510. Mask 6 Photographs, Healthdyne Technologies, Soft Series

Nasal CPAP Mask, Part # 702020. Mask 7 Photographs, DeVilbiss Healthcare Inc., Small Mask and Seal Rings, Part # 73510–668.

Mask 8 Photographs, Respironics Inc., Reusable Contour Mask (medium), Part # 302180.

Mask 9 Photographs, Healthdyne Technologies, Healthdyne Large Headgear.

Mask 10 Photographs, Respironics Inc., Soft Cap (medium), Part # 302142.

Mask 11 Photographs, Weinmann: Hamburg, Nasalmaskensystem mit Schalldämpfer (medium), Part # WN 23105. Mask 12 Photographs, Life Care.

Mask 13 Photographs, Healthdyne Technologies.

Mask 14 Photograph, King System.

Mask 15 Photographs, Respironics Inc., Paediatric Mask. Mask 16 Photographs, Hans Rudolph Inc., Hans Rudolph Silicone Rubber Face Mask/8900.

Derwent: Flowmeter for fluids-has turbine transducer and volumetric sensor for simultaneous calibration.

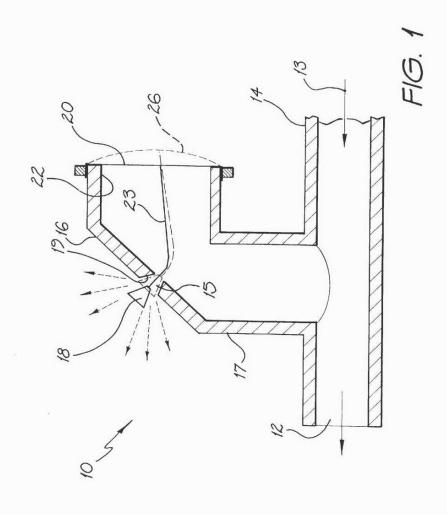
Mark Kantrowitz, Erik Horskotte and Cliff Joslyn; "Answers to Frequently Asked Questions about Fuzzy Logic and Fuzzy Expert Systems" Version 1.24 last Modified Feb. 20, 1996.

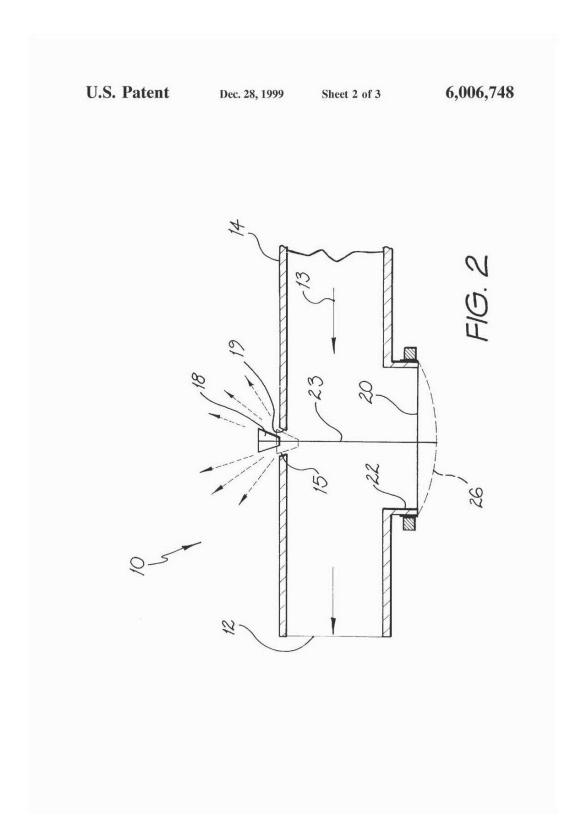
U.S. Patent

Dec. 28, 1999

Sheet 1 of 3

6,006,748





6,006,748 U.S. Patent Dec. 28, 1999 Sheet 3 of 3 12

VENT VALVE APPARATUS

FIELD OF THE INVENTION

The present invention relates to a vent valve apparatus for use with a system, for supplying breathable gas pressurised above atmospheric pressure to a human or animal.

The invention has been developed primarily for use in controlling the venting of washout gas in a continuous positive airway pressure (CPAP) gas delivery systems used, for example, in the treatment of obstructive sleep apnea (OSA) and similar sleep disordered breathing conditions. The invention may also be used in conjunction with suitable mask and gas delivery system for the application of assisted ventilation treatment.

The term "mask" is herein intended to include face masks, nose masks, mouth masks, appendages in the vicinity of any of these masks and the like.

BACKGROUND OF THE INVENTION

Treatment of OSA by CPAP flow generator systems involves the continuous delivery of air (or breathable gas) pressurised above atmospheric pressure to a patient's airways via a conduit and a mask. CPAP pressures of 4 cm H₂O to 22 cm H₂O are typically used for treatment of sleep ²⁵ disordered breathing due to OSA and/or central apnea, depending on patient requirements.

Treatment pressures for assisted ventilation can range up to 32 cm $\rm H_2O$ and beyond, depending on patient requirements.

For either the treatment of OSA or the application of assisted ventilation, the pressure of the gas delivered to patients can be constant level, bi-level (in synchronism with patient inspiration and expiration) or autosetting in level. Throughout this specification the reference to CPAP is intended to incorporate a reference to any one of, or combinations of, these forms of pressure delivery.

The prior art method for providing CPAP treatment includes a vent for gas washout of the gas flow. The vent is normally located at or near the mask or in the gas delivery conduit. The flow of gas through the vent is essential for removal of exhaled gases from the breathing circuit. Adequate gas washout is achieved by selecting a vent size and configuration that will allow a minimum safe gas flow at the lowest operating CPAP pressure, which, typically can be as low as, around 4 cm H₂O for adults and 2 cm H₂O in paediatric applications.

Existing vent configurations include single or multiple holes, foam diffusers, slots and combinations thereof. A $_{50}$ reference herein to a vent may be understood to include a reference to one or more holes, foam diffusers, slots or any combination of them.

The flow of gas from the gas delivery system through the vent to atmosphere creates noise as the delivered gas, and 55 upon expiration the patient expired gas including CO_2 , passes through the vent. Increasing CPAP pressure results in more gas passing through the vent which in turn creates more noise. Existing prior art vents produce excessive noise when CPAP pressures are raised above about 4 cm $\mathrm{H}_2\mathrm{O}_1$. This noise can adversely affect patient and bed-partner comfort. Existing vents are also inefficient as they allow more gas through the vent than is required for adequate exhaust gas washout and thereby require the flow generator to provide more flow than is necessary in order to maintain 65 the required treatment pressure. Further, where treatment gas is being supplied, such as oxygen, surplus treatment gas

2

is vented and thereby wasted unnecessarily. A similar waste occurs where the supplied gas is humidified.

It is an object of the present invention to overcome or at least ameliorate one or more of these deficiencies of the prior art.

SUMMARY OF THE INVENTION

Accordingly, the invention provides a vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂ gas through the washout vent over a range of gas supply pressures.

Preferably, the system supplies breathable gas to a human patient.

The breathable gas is desirably air.

In an embodiment of the invention, the gas washout vent consists of an orifice having the shape of an outwardly diverging truncated cone and the vent valve is a complementary cone shaped plug. The rim of the cone shaped orifice acts as a valve seat for the cone shaped plug.

Desirably, the pressure sensitive vent valve control means includes an elastic diaphragm connected to the vent valve such that displacement of the diaphragm results in displacement of the vent valve. In an embodiment, the diaphragm is produced from a rubber or other elastic diaphragm stretched over a circular orifice. The vent valve is preferably connected to the rubber by a connection means that allows for the stroke of the vent valve to be adjusted.

The vent valve is desirably attached to the centre of the rubber diaphragm by a connection means such as a rod, the rod being operatively connected to both the vent valve and the diaphragm.

In a preferred embodiment, the vent valve and diaphragm are directly connected by the rod. The rod is preferably rigid, such that movement of the diaphragm is directly proportional to the movement of the vent valve.

In another embodiment, the connection means include a lever assembly connecting the vent valve to the diaphragm so as to permit differing ratios of movement and mechanical advantage of the vent valve relative to the diaphragm.

Such an assembly can include a tension means that opposes the movement of the diaphragm caused by increasing gas supply pressure so as to bias the vent valve to a position where the flow area of the orifice is maximised.

It will be understood that the orifice covered by the diaphragm need not be circular and can be any convenient shape.

In one preferred configuration, the vent valve apparatus is provided in a branch connection from a mask. In another preferred configuration, the vent valve apparatus is provided in an air supply conduit substantially adjacent the mask.

In a further embodiment, the vent valve apparatus includes an aerodynamic member such as an aerofoil or wing. The member is disposed in the air supply conduit by a biased pivot mechanism and has an axis of rotation transverse to the direction of gas flow. Gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of

the gas flowing through the conduit. As the gas velocity increases the aerodynamic member produces increase lift and the resulting rotational displacement is transmitted to the vent valve which restricts the flow area of the washout vent. The vent valve is preferably biased open to a maximum washout vent flow area by a tension means such as a spring.

In a further preferred embodiment an aerodynamic member is suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch. Rotation around the axis is in response to the gas flow, which is 10 proportional to the pressure in the conduit. The member is connected to the vent valve such that as the pressure in the conduit increases the rotational displacement of the aerodynamic member causes corresponding movement of the vent valve, resulting in a reduction of the flow area of the washout vent. A tension means is adapted to bias the vent valve, such as a spring, operates on the aerodynamic member to oppose the rotation caused by the gas flow on the aerodynamic member. The tension means biases the aerodynamic member in a rotational direction opposite to the direction induced by 20 the gas flow entering the branch from the conduit.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention will now be described, by way of examples only, with reference to the accompanying drawings in which:

FIG. 1 is a schematic sectional side view of a vent valve apparatus according to the first embodiment of the invention:

FIG. 2 is a schematic sectional side view of a vent valve apparatus is according to a second embodiment of the invention; and

 ${
m FIG.}~3$ is a schematic sectional side view of a vent valve according to a third embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, there is shown a vent valve apparatus 10 according to a first embodiment of the invention. The vent valve apparatus 10 is connected to a mask (not shown) at 12. The mask is adapted to receive a continuous supply of gas 13 above atmospheric pressure from a flow generator (not shown) through a flexible conduit 14. The apparatus 10 includes a gas washout vent, in the form of a substantially conical orifice 15 formed in a wall 16 of the pipe branch 17, and a vent valve in the form of a substantially conical plug 18. The im 19 of the orifice 15 acts as a valve seat for the plug 18. The apparatus 10 also includes a pressure sensitive vent valve control means which includes an elastic diaphragm 20 stretched over a circular orifice 22 of the branch 17, and a rigid wire rod 23 connecting the plug 18 to the centre of the diaphragm 20.

In this embodiment, the plug 18 is conical and the orifice 55 is circular. In other embodiments (not shown), the plug and the orifice are other complimentary shapes.

The orifice 15 provides an outlet for the removal of gas upon patient expiration. Gas removal is aided by the continuous flow of gas pressurised above atmospheric pressure flowing through the conduit 14 and to atmosphere through the orifice 15.

As the air pressure in conduit 14 increases, corresponding increases occur in the air pressure adjacent diaphragm 20. These pressure increases cause diaphragm 20 to bulge to the position represented by phantom line 26. The displacement of the centre of the diaphragm 20 results in corresponding

displacement in the plug 18, causing the plug 18 to be drawn into the orifice 15 thereby restricting the flow of gases through the vent orifice. In this way, the flow area of the vent is restricted at higher delivery pressures thereby reducing flow of gas through the orifice 15 compared to a fully open orifice.

The apparatus can be calibrated by adjusting the length of the wire rod 23 between the plug 18 and the diaphragm $20.\,$

The vent valve apparatus 10 thereby maintains the airflow through the vent at, or at least near, the optimum safe minimum amount. This has the effect of reducing the noise produced at higher CPAP pressures, compared to the noise emitted by a similar orifice without the vent valve. A quieter vent improves patient and bed-partner comfort. An additional benefit provided by the invention is the reduction in the amount of wasted gas forced through the vent unnecessarily at higher CPAP treatment pressures.

A prototype of the first embodiment of the invention shown in FIG. 1 has been tested over a range of CPAP treatment pressures utilising the present Applicant's Sullivan™ flow generator made by ResMed Limited and Sullivan™ mask frame (fitted with Series 3 Sullivan™ Bubble Cushion™ modified in accordance with the teaching of this invention. This prototype was also tested without the conical plug 18. The results of the tests are summarised in the table below:

TABLE 1

Performance Comparison for Prototype Vent Valve Apparatus With and Without the Conical Plug

	With		Without		
CPAP Pressure cmH20	Air Flow l/m	Sound Pressure Level dB (A)	Air Flow l/m	Sound Pressure Level dB (A)	
4	11.2	34.1	11.9	36.1	
10	14.4	46.8	19.5	48.4	
18.5	9.0	52.7	26.7	55.7	

As the results show, the prototype vent valve according to the first embodiment of the invention maintained a substantially constant air flow through the vent over a wide range of CPAP treatment pressures compared to the large variation exhibited by a similar mask without the conical plug. Further, at all pressures, the noise produced by the mask using the vent valve apparatus according to the first embodiment of the invention was less than the same mask without the conical plug.

Referring now to FIG. 2, there is shown a vent valve apparatus according to a second embodiment of the invention. Like reference numerals to those used in FIG. 1 will be used to indicate like features in FIG. 2. This second embodiment functions in the same way as the first embodiment in that an increase in pressure in the conduit 14 causes the diaphragm 20 to bulge and draw the plug 18 into the washout valve orifice 15, thereby restricting the flow of gas through that orifice.

A third embodiment of the present invention is shown in FIG. 3. Once again, like reference numerals are used to indicate like features. This third embodiment includes an aerodynamic member, in the form of wing 30, which is disposed in conduit branch 17 and adapted to pivot about an axis transverse to the direction of the gas flow along the conduit branch 17. The wing 30 is connected to a pivot mechanism, indicated generally at 31, which includes a connecting rod 33 and pilot joint 34. The connecting rod 33

-

and pivot joint 34 operatively connects the plug 18 to the wing 30. is used to bias the wing 30 and plug 18 to a position where the flow area of orifice 15 is maximized. As gas supply 13 is forced through the conduit 14, branch 17 and over the wing 30, the wing generates lift which opposes the spring and causes displacement of the wing to the position shown by phantom line 37, thereby drawing plug 18 into orifice 15 as shown by phantom line 32 and, thereby reducing the flow area of the gas washout orifice 15. Accordingly, the higher the pressure and flow rate of air passing through the branch 17 of the conduit 14, the more lift is produced by the wing and the more the flow area of the washout vent orifice 15 is restricted.

As with the earlier embodiments described above, this maintains a substantially constant air flow through the 15 washout vent orifice.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

I claim:

- 1. A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent defined by an orifice having the shape of an outwardly diverging truncated cone, a vent valve having the shape of a cone shaped plug complimentary to the shape of the washout vent, the vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and or CO₂ through the washout vent over a range of gas supply pressures.
- An apparatus as claimed in claim 1, wherein the rim of the cone shaped orifice acts as a valve seat for the cone shaped plug.
- 3. An apparatus as claimed in claim 1, wherein the vent valve apparatus is provided in a branch connection from a mask.
- 4. An apparatus as claimed in claim 1, wherein, the vent valve apparatus is provided in an air supply conduit substantially adjacent the mask.
- 5. A vent valve apparatus for use with a system for 45 supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus comprising:
- a gas washout vent;
- a vent valve adapted to progressively restrict the flow area of the washout vent;
- a pressure sensitive vent valve control means, including an elastic diaphragm, produced from a rubber or other elastic diaphragm stretched over a circular orifice, connected to the vent valve such that displacement of 55 the diaphragm results in displacement of the vent valve, adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of $_{60}$ gas and or CO_2 through the washout vent over a range of gas supply pressures; and
- means for connecting the vent valve to the rubber diaphragm to allow for the stroke of the vent valve to be adjusted.
- An apparatus as claimed in claim 5, wherein the vent valve is attached to the centre of the rubber diaphragm and

6 said connection means is a rod, the rod being operatively connected to both the vent valve and the diaphragm.

- 7. An apparatus as claimed in claim 6, wherein the vent valve and diaphragm are directly connected by the rod.
- 8. An apparatus as claimed in claim 7, wherein the rod is rigid, such that movement of the diaphragm is directly proportional to the movement of the vent valve.
- 9. An apparatus as claimed in claim 5, wherein the connection means includes a lever assembly connecting the vent valve to the diaphragm so as to permit differing ratios of movement and mechanical advantage of the vent valve relative to the diaphragm.
- 10. An apparatus as claimed in claim 9, wherein the lever assembly includes a tension means that opposes the movement of the diaphragm caused by increasing gas supply pressure so as to bias the vent valve to a position where the flow area of the orifice is maximised.
- 11. A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus comprising:
 - a gas washout vent;
 - a vent valve adapted to progressively restrict the flow area of the washout vent; and
- a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, said vent valve control means including an aerodynamic member suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch, thereby substantially regulating the volumetric flow of gas and/or CO₂ through the washout vent over a range of gas supply pressures.

12. An apparatus as claimed in claim 11, wherein the member is connected to the vent valve such that as the pressure in the conduit increases the rotational displacement of the aerodynamic member causes corresponding movement of the vent valve, resulting in a reduction of the flow area of the washout vent.

- 13. A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus comprising:
 - a gas washout vent;
- a vent valve adapted to progressively restrict the flow area of the washout vent; and
- a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, said vent valve control means including an aerodynamic member disposed in the air supply conduit by a biased pivot mechanism and having an axis of rotation transverse to the direction of gas flow whereby gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of the gas flowing through the conduit thereby substantially regulating the volumetric flow of gas and/or CO₂ through the washout vent over a range of gas supply pressures.
- 14. An apparatus as claimed in claim 13, wherein as the gas velocity increases the aerodynamic member produces increase lift and the resulting rotational displacement is transmitted to the vent valve which restricts the flow area of the washout vent.
- 15. An apparatus as claimed in claim 13, wherein the aerodynamic member is an aerofoil.

- 16. An apparatus as claimed in claim 13, wherein the aerodynamic member is a wing.

 17. An apparatus as claimed claim 13, wherein the vent valve is biased open to a maximum washout vent flow area by a tension means.

 18. An apparatus as claimed in claim 17, wherein the tension means is a spring.

 19. An apparatus as claimed in claim 17, wherein a tension means is adapted to bias the vent valve, the tension

8

means operates on the aerodynamic member to oppose the rotation caused by the gas flow on the aerodynamic member, whereby the tension means biases the aerodynamic member in a rotational direction opposite to the direction induced by 5 the gas flow entering the branch from the conduit.

20. An apparatus as claimed in claim 19, wherein the tension means is a spring.

71694 U.S. PTO 08/951357

PATENT APPLICATION SERIAL NO.

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE FEE RECORD SHEET

PTO-1556 (5/87) DBSULIUV IDAGS

The state of the s

THE COMMISSIONER OF PATENTS AND TRADEMARKS Washington, D.C. 20231

Express Mail No. EM532283284US Mailing Date October 16, 1997 Attorney Docket No. 38730.830026.000

_		r	_
H		Q	•
-			2
3		÷	=
		•	
53		C	_
띥		•	1

Sir;	
Transmitte	ed herewith for filing is the Patent Application of:
Inventor:	Shane Douglas HOLLIS
For: VEN	T VALVE APPARATUS

Sheets of Formal Drawings.

Enclosed are:

☐ A true copy of _____ application, Serial No.

☐ An associate power of attorney.

 Verified statement to establish small entity status under 7 CFR 1.9 and 37 CFR 1.27 (Inventor)

A declaration and power of attorney (unsigned).

The filing has been calculated as shown below:

	(Col. 1)	(Col. 2)
FOR:	NO. FILED	NO. EXTRA
BASIC FEE	mmmm	mmm
TOTAL CLAIMS	25 - 20 =	5
INDEP CLAIMS	1-3 =	0

SMALL ENTITY			OTHER THAN A SMALL ENTITY		
RATE	FEE	O R	RATE	FEE	
IIIII	\$395	O R	ınıı	\$790	
X 11 =	55	O R	X 22 =	\$ 0	
x 41 =	0	O R	x 82 =	\$ 0	
+135 =	0	OR.	+270 =	\$ 0	

		nce in Col. 1 is less nter "0" in Col. 2	TOTAL \$ 450	OR	TOTAL \$ 0				
		Please charge my Deposit Account No in the amount of \$ A duplicate of this sheet is attached.							
	A check in the amount of \$ is enclosed to cover the filing fee.								
		sioner is hereby authorized to charge t to Deposit Account No. 08-2623.	payment of the following fees associated with this com	munication or	credit any				
		Any patent application processing fees under 37 CFR 17.							
		The issue fee set in 37 CFR 1.18 et or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).							
		Any filing fees under 37 CFR 1.16 for presentation of extra claim.							

Andrew D. Sorensen, Reg. No. 33,606 HOLLAND & HART LLP 555 Seventeenth Street, Suite 3200 Post Office Box 8749 Denver, Colorado 80201 (303) 295-8194

Dated: October 16, 1997

HH:797485 v1

A VENT VALVE APPARATUS

Field of the Invention

The present invention relates to a vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal.

The invention has been developed primarily for use in controlling the venting of washout gas in a continuous positive airway pressure (CPAP) gas delivery systems used, for example, in the treatment of obstructive sleep apnea (OSA) and similar sleep disordered breathing conditions. The invention may also be used in conjunction with suitable mask and gas delivery system for the application of assisted ventilation treatment.

The term "mask" is herein intended to include face masks, nose masks, mouth masks, appendages in the vicinity of any of these masks and the like.

Background of the Invention

Treatment of OSA by CPAP flow generator systems involves the continuous delivery of air (or breathable gas) pressurised above atmospheric pressure to a patient's airways via a conduit and a mask. CPAP pressures of 4 cm H₂O to 22 cm H₂O are typically used for treatment of sleep disordered breathing due to OSA and/or central apnea, depending on patient requirements.

Treatment pressures for assisted ventilation can range up to 32 cm H₂O and beyond, depending on patient requirements.

For either the treatment of OSA or the application of assisted ventilation, the pressure of the gas delivered to patients can be constant level, bi-level (in synchronism with patient inspiration and expiration) or autosetting in level. Throughout this specification the reference to CPAP is intended to incorporate a reference to any one of, or combinations of, these forms of pressure delivery.

The prior art method for providing CPAP treatment includes a vent for gas washout of the gas flow. The vent is normally located at or near the mask or in the gas delivery conduit. The flow of gas through the vent is essential for removal of exhaled gases from the breathing circuit. Adequate gas washout is achieved by selecting a vent size and configuration that will allow a minimum safe gas flow at the lowest operating CPAP pressure, which, typically can be as low as, around 4 cm H₂O for adults and 2 cm H₂O in paediatric applications.

Existing vent configurations include single or multiple holes, foam diffusers, slots and combinations thereof. A reference herein to a vent may be understood to include a reference to one or more holes, foam diffusers, slots or any combination of them.

The flow of gas from the gas delivery system through the vent to atmosphere creates noise as the delivered gas, and upon expiration the patient expired gas including

 CO_2 , passes through the vent. Increasing CPAP pressure results in more gas passing through the vent which in turn creates more noise. Existing prior art vents produce excessive noise when CPAP pressures are raised above about 4 cm H_2O . This noise can adversely affect patient and bed-partner comfort. Existing vents are also inefficient as they allow more gas through the vent than is required for adequate exhaust gas washout and thereby require the flow generator to provide more flow than is necessary in order to maintain the required treatment pressure. Purther, where treatment gas is being supplied, such as oxygen, surplus treatment gas is vented and thereby wasted unnecessarily. A similar waste occurs where the supplied gas is humidified.

It is an object of the present invention to overcome or at least ameliorate one or more of these deficiencies of the prior art.

Summary of the Invention

Accordingly, the invention provides a vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂ gas through the washout vent over a range of gas supply pressures.

Preferably, the system supplies breathable gas to a human patient.

The breathable gas is desirably air.

In an embodiment of the invention, the gas washout vent consists of an orifice having the shape of an outwardly diverging truncated cone and the vent valve is a complementary cone shaped plug. The rim of the cone shaped orifice acts as a valve seat for the cone shaped plug.

Desirably, the pressure sensitive vent valve control means includes an elastic diaphragm connected to the vent valve such that displacement of the diaphragm results in displacement of the vent valve. In an embodiment, the diaphragm is produced from a rubber or other elastic diaphragm stretched over a circular orifice. The vent valve is preferably connected to the rubber by a connection means that allows for the stroke of the vent valve to be adjusted.

The vent valve is desirably attached to the centre of the rubber diaphragm by a connection means such as a rod, the rod being operatively connected to both the vent valve and the diaphragm.

In a preferred embodiment, the vent valve and diaphragm are directly connected by the rod. The rod is preferably rigid, such that movement of the diaphragm is directly proportional to the movement of the vent valve.

In another embodiment, the connection means include a lever assembly connecting the vent valve to the diaphragm so as to permit differing ratios of movement and mechanical advantage of the vent valve relative to the diaphragm.

Such an assembly can include a tension means that opposes the movement of the diaphragm caused by increasing gas supply pressure so as to bias the vent valve to a position where the flow area of the orifice is maximised.

It will be understood that the orifice covered by the diaphragm need not be circular and can be any convenient shape.

In one preferred configuration, the vent valve apparatus is provided in a branch connection from a mask. In another preferred configuration, the vent valve apparatus is provided in an air supply conduit substantially adjacent the mask.

In a further embodiment, the vent valve apparatus includes an aerodynamic member such as an aerofoil or wing. The member is disposed in the air supply conduit by a biased pivot mechanism and has an axis of rotation transverse to the direction of gas flow. Gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of the gas flowing through the conduit. As the gas velocity increases the aerodynamic member produces increase lift and the resulting rotational displacement is transmitted to the vent valve which restricts the flow area of the washout vent. The vent valve is preferably biased open to a maximum washout vent flow area by a tension means such as a spring.

In a further preferred embodiment an aerodynamic member is suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch. Rotation around the axis is in response to the gas flow, which is proportional to the pressure in the conduit. The member is connected to the vent valve such that as the pressure in the conduit increases the rotational displacement of the aerodynamic member causes corresponding movement of the vent valve, resulting in a reduction of the flow area of the washout vent. A tension means is adapted to bias the vent valve, such as a spring, operates on the aerodynamic member to oppose the rotation caused by the gas flow on the aerodynamic member. The tension means biases the aerodynamic member in a rotational direction opposite to the direction induced by the gas flow entering the branch from the conduit.

Brief Description of the Drawings

Preferred embodiments of the invention will now be described, by way of examples only, with reference to the accompanying drawings in which:

Figure 1 is a schematic sectional side view of a vent valve apparatus according to the first embodiment of the invention;

Figure 2 is a schematic sectional side view of a vent valve apparatus according to a second embodiment of the invention; and

Figure 3 is a schematic sectional side view of a vent valve according to a third embodiment of the invention.

Description of the Preferred Embodiments

Referring to Figure 1, there is shown a vent valve apparatus 10 according to a first embodiment of the invention. The vent valve apparatus 10 is connected to a mask (not shown) at 12. The mask is adapted to receive a continuous supply of gas 13 above atmospheric pressure from a flow generator (not shown) through a flexible conduit 14. The apparatus 10 includes a gas washout vent, in the form of a substantially conical orifice 15 formed in a wall 16 of the pipe branch 17, and a vent valve in the form of a substantially conical plug 18. The rim 19 of the orifice 15 acts as a valve seat for the plug 18. The apparatus 10 also includes a pressure sensitive vent valve control means which includes an elastic diaphragm 20 stretched over a circular orifice 22 of the branch 17, and a rigid wire rod 23 connecting the plug 18 to the centre of the diaphragm 20.

In this embodiment, the plug 18 is conical and the orifice 15 is circular. In other embodiments (not shown), the plug and the orifice are other complimentary shapes.

The orifice 15 provides an outlet for the removal of gas upon patient expiration. Gas removal is aided by the continuous flow of gas pressurised above atmospheric pressure flowing through the conduit 14 and to atmosphere through the orifice 15.

As the air pressure in conduit 14 increases, corresponding increases occur in the air pressure adjacent diaphragm 20. These pressure increases cause diaphragm 20 to bulge to the position represented by phantom line 26. The displacement of the centre of the diaphragm 20 results in corresponding displacement in the plug 18, causing the plug 18 to be drawn into the orifice 15 thereby restricting the flow of gases through the vent orifice. In this way, the flow area of the vent is restricted at higher delivery pressures thereby reducing flow of gas through the orifice 15 compared to a fully open orifice.

The apparatus can be calibrated by adjusting the length of the wire rod 23 between the plug 18 and the diaphragm 20.

The vent valve apparatus 10 thereby maintains the airflow through the vent at, or at least near, the optimum safe minimum amount. This has the effect of reducing the noise produced at higher CPAP pressures, compared to the noise emitted by a similar orifice without the vent valve. A quieter vent improves patient and bed-partner comfort. An additional benefit provided by the invention is the reduction in the amount of wasted gas forced through the vent unnecessarily at higher CPAP treatment pressures.

A prototype of the first embodiment of the invention shown in Figure 1 has been tested over a range of CPAP treatment pressures utilising the present Applicant's Sullivan[™] V flow generator made by ResMed Limited and Sullivan[™] mask frame (fitted with Series 3 Sullivan[™] Bubble Cushion[™]) modified in accordance with the teaching of this invention. This prototype was also tested without the conical plug 18. The results of the tests are summarised in the table below:

TABLE 1

Performance Comparison for Prototype Vent Valve Apparatus With and Without the Conical Plug									
CPAP Pressure	. With		Without						
cmH20	Air Flow	Sound Pressure	Air Flow	Sound Pressure					
	l/m	Level dB(A)	l/m	Level dB(A)					
4	11.2	34.1	11.9	36.1					
10	14.4	46.8	19.5	48.4					
18.5	9.0	52.7	26.7	55.7					

As the results show, the prototype vent valve according to the first embodiment of the invention maintained a substantially constant air flow through the vent over a wide range of CPAP treatment pressures compared to the large variation exhibited by a similar mask without the conical plug. Further, at all pressures, the noise produced by the mask using the vent valve apparatus according to the first embodiment of the invention was less than the same mask without the conical plug.

Referring now to Figure 2, there is shown a vent valve apparatus according to a second embodiment of the invention. Like reference numerals to those used in Figure 1 will be used to indicate like features in Figure 2. This second embodiment functions in the same way as the first embodiment in that an increase in pressure in the conduit 14 causes the diaphragm 20 to bulge and draw the plug 18 into the washout valve orifice 15, thereby restricting the flow of gas through thAT orifice.

A third embodiment of the present invention is shown in Figure 3. Once again, like reference numerals are used to indicate like features. This third embodiment includes an aerodynamic member, in the form of wing 30, which is disposed in conduit branch 17 and adapted to pivot about an axis transverse to the direction of the gas flow along the conduit branch 17. The wing 30 is connected to a pivot mechanism, indicated generally at 31, which includes a connecting rod 33 and pivot joint 34. The connecting rod 33 and pivot joint 34 operatively connects the plug 18 to the wing 30. A spring 36

is used to bias the wing 30 and plug 18 to a position where the flow area of orifice 15 is maximized. As gas supply 13 is forced through the conduit 14, branch 17 and over the wing 30, the wing generates lift which opposes the spring and causes displacement of the wing to the position shown by phantom line 37, thereby drawing plug 18 into orifice 15 as shown by phantom line 32 and, thereby reducing the flow area of the gas washout orifice 15. Accordingly, the higher the pressure and flow rate of air passing through the branch 17 of the conduit 14, the more lift is produced by the wing and the more the flow area of the washout vent orifice 15 is restricted.

As with the earlier embodiments described above, this maintains a substantially constant air flow through the washout vent orifice.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

July 5

I claim:

1. A vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂ gas through the washout vent over a range of gas supply pressures.

P. An apparatus as claimed in claim 1, wherein the system supplies breathable gas to a human patient.

An apparatus as claimed in claim 1, wherein the breathable gas is air.

4. An apparatus as claimed in claim 1, wherein the gas washout vent consists of an orifice having the shape of an outwardly diverging truncated cone and the vent valve is a complementary cone shaped plug.

5. An apparatus as claimed in claim A, wherein the rim of the cone shaped orifice acts as a valve seat for the cone shaped plug.

 An apparatus as claimed in claim 1, wherein the vent valve apparatus is provided in a branch connection from a mask.

7. An apparatus as claimed in claim 1, wherein, the vent valve apparatus is provided in an air supply conduit substantially adjacent the mask.

8. An apparatus as claimed in claim 1, wherein the pressure sensitive vent valve control means includes an elastic diaphragm connected to the vent valve such that displacement of the diaphragm results in displacement of the vent valve.

An apparatus as claimed in claim 8, wherein the diaphragm is produced from a rubber or other elastic diaphragm stretched over a circular orifice.

10. An apparatus as claimed in claim 9, wherein the vent valve is connected to the rubber diaphragm by a connection means that allows for the stroke of the vent valve to be adjusted.

An apparatus as claimed in claim 10, wherein the vent valve is attached to the centre of the rubber diaphragm and said connection means is a rod, the rod being operatively connected to both the vent valve and the diaphragm.

12. An apparatus as claimed in claim 11, wherein the vent valve and diaphragm are directly connected by the rod.

An apparatus as claimed in claim 12, wherein the rod is rigid, such that movement of the diaphragm is directly proportional to the movement of the vent valve.

14. An apparatus as claimed in claim 18, wherein the connection means includes a lever assembly connecting the vent valve to the diaphragm so as to permit

a

2

21

differing ratios of movement and mechanical advantage of the vent valve relative to the diaphragm.

- 15. An apparatus as claimed in claim 14, wherein the lever assembly includes a tension means that opposes the movement of the diaphragm caused by increasing gas supply pressure so as to bias the vent valve to a position where the flow area of the orifice is maximised.
- 16. An apparatus as claimed in claim 1, wherein the vent valve apparatus includes an aerodynamic member disposed in the air supply conduit by a biased pivot mechanism and having an axis of rotation transverse to the direction of gas flow whereby gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of the gas flowing through the conduit.
- 17. An apparatus as claimed in claim 16, wherein as the gas velocity increases the aerodynamic member produces increase lift and the resulting rotational displacement is transmitted to the vent valve which restricts the flow area of the washout vent.
- 18. An apparatus as claimed in claim 16, wherein the aerodynamic member is an aerofoil.
- 19. An apparatus as claimed in claim 16, wherein the aerodynamic member is a wing.
- 20. An apparatus as claimed claim 16, wherein the vent valve is biased open to a maximum washout vent flow area by a tension means.
- An apparatus as claimed in claim 20, wherein the tension means is a spring.
- An apparatus as claimed in claim 1, wherein the vent valve apparatus includes an aerodynamic member suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch.
- 23. An apparatus as claimed in claim 22, wherein the member is connected to the vent valve such that as the pressure in the conduit increases the rotational displacement of the aerodynamic member causes corresponding movement of the vent valve, resulting in a reduction of the flow area of the washout vent.
- 24. An apparatus as claimed in claim 20, wherein a tension means is adapted to bias the vent valve, the tension means operates on the aerodynamic member to oppose the rotation caused by the gas flow on the aerodynamic member, whereby the tension means biases the aerodynamic member in a rotational direction opposite to the direction induced by the gas flow entering the branch from the conduit.
- 25. An apparatus as claimed in claim 24, wherein the tension means is a spring.

full 10

July>"

il.

ABSTRACT

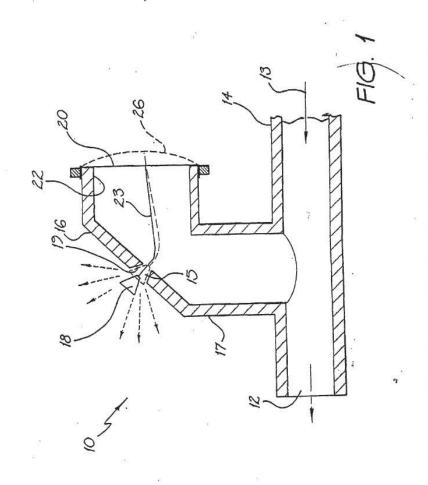
A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂ gas through the washout vent (15) over a range of gas supply pressures.

PRINT OF DRAWINGS
AS ORIGINALLY FILES

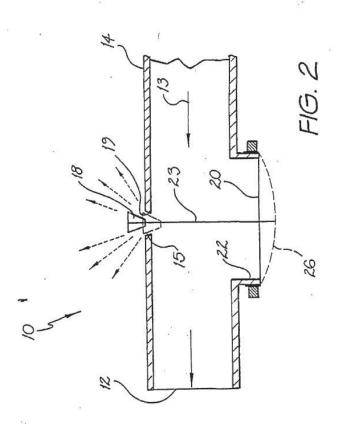
03/205.24

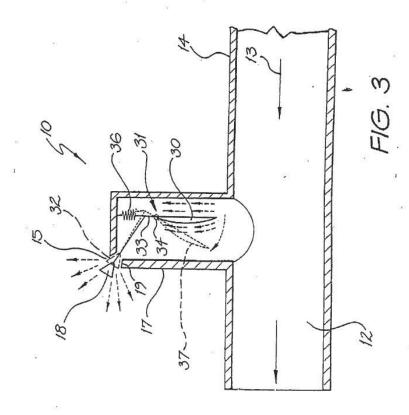


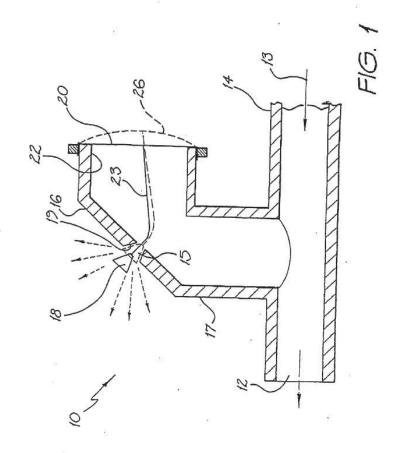


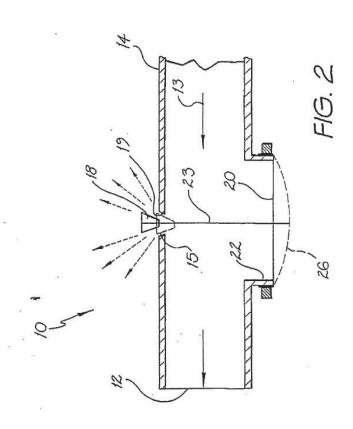


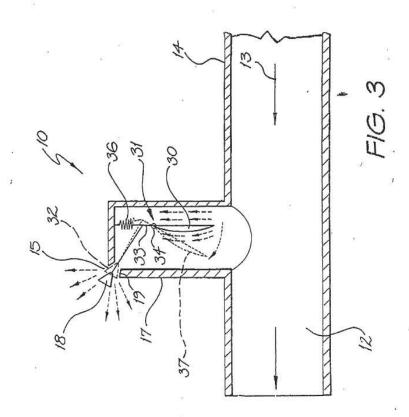












Attorney's Docket No38730.830026.000	PATENT
COMBINED DECLARATION AND POWER OF ATT	ORNEY
(ORIGINAL. DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENT, CONTINUATION OR C-I-P)	AL, DIVISIONAL,
As a below named inventor, I hereby declare that:	
TYPE OF DECLARATION	
This declaration is of the following type:	
(check one applicable item below)	
design. design. supplemental. NOTE: If the declaration is for an International Application being filed as a divident continuation-in-part application, do not check next item; check appropriate of national stage of PCT. NOTE: If one of the following 3 items apply, then complete and also attach ADDED PCONTINUATION OR C-I-P. divisional. continuation.	one of last three items.
continuation-in-part (C-I-P).	
INVENTORSHIP IDENTIFICATION	SA .
WARNING: If the inventors are each not the inventors of all the claims, an explanation the ownership of all the claims at the time the last claimed invention was ma	
My residence, post office address and citizenship are as stated below I believe that I am the original, first and sole inventor (if only one name an original, first and joint inventor (if plural names are listed below) of that is claimed, and for which a patent is sought on the invention entitle.	e is listed below) or the subject matter
TITLE OF INVENTION	
9 BL	

VENT VALVE APPARATUS

the specification of which:

(complete (a), (b) or (c))

to the oath or declaration at the time of execution and submitted with the oath or declaration filling;		
filing cate with a specification are acceptable as minimums for identifying a specification and combinate with any one of the items below will be accepted as complying with the icentification requirement of 37 CFR 1.63: "(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing; "(2) name of inventor(s), and attorney docket number which was on the specification as filed or "(3) name of inventor(s), and title which was on the specification as filed." Notice of July 13, 1995 (1177 O.G. 60). (b) was filled on	(a) 🗆	is attached hereto.
to the oath or declaration at the time of execution and submitted with the oath or declaration on filing; "(2) name of inventor(s), and attorney docket number which was on the specification as filed or "(3) name of inventor(s), and title which was on the specification as filed." Notice of July 13, 1995 (1177 O.G. 60). (b) was filed on		filing cate with a specification are acceptable as minimums for identifying a specification and compliand with any one of the items below will be accepted as complying with the identification requirement o
(b) was filed on		
Notice of July 13, 1995 (1177 O.G. 60). (b) was filed on		"(2) name of inventor(s), and attorney docket number which was on the specification as filed or
(b) was filed on		"(3) name of inventoris), and title which was on the specification as filed."
(b) was filed on		Notice of July 13, 1995 (1177 O.G. 60).
and was amended on	(b) 🗆	was filed on as \square Serial No. 0 /
not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involve are those filed with the application papers or, in the case of a supplemental declaration, are thos amendments claiming matter not encompassed in the original statement of invention or claims. Se 37 CFR 1.67. NOTE: "The following combinations of information supplied in an path or declaration filed after the filling dat are acceptable as minimums for identifying a specification and compliance with any one of the item below will be accepted as complying with the identification requirement of 37 CFR 1.62. "(1) name of inventor(s), and application number (consisting of the series code and the serie number, e.g., 08/123, 456); "(2) name of inventor(s), serial number and filling date; "(3) name of inventor(s) and attorney docket number which was on the specification as filed and filling date; "(5) name of inventor(s), title which was on the specification as filed and reference to a attached specification which is both attached to the oath or declaration at the time of executio and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filed and accompanied be a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123, 456, c. serial number and filling date. Absent any statement(s) to the contrary, it will be presumed the the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration." Notice of July 13, 1995 (1177 O.G. 60).		and was amended on (if applicable).
are acceptable as minimums for identifying a specification and compliance with any one of the item below will be accepted as complying with the identification requirement of 37 CFR 1.63: "(1) name of inventor(s), and application number (consisting of the series code and the serie number; e.g., 081*25, 456); "(2) name of inventor(s), serial number and filing date; "(3) name of inventor(s) and attorney docket number which was on the specification as filed and filing date; "(4) name of inventor(s), title which was on the specification as filed and reference to a attached specification which is both attached to the eath or declaration at the time of executio and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filed and accompanied be a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number ag. 081*23,455), c. serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration." Notice of July 13, 1995 (1177 O.G. 80).		not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involves those filed with the application papers or, in the case of a supplemental declaration, are those mendments claiming matter not encompassed in the original statement of invention or claims. Se 37 CFR 1.67.
number, e.g.,08/123,456); "(2) name of inventor(s), serial number and filling date: "(3) name of inventor(s) and attorney docket number which was on the specification as filled "(4) name of inventor(s), title which was on the specification as filled and filling date; "(5) name of inventor(s), title which was on the specification as filled and reference to a attached specification which is both attached to the oath or declaration at the time of executio and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filled and accompanied b a cover letter accurately identifying the application for which it was intended by either th application number (consisting of the series code and the serial number, e.g.,08/123,456, o serial number and filling date. Absent any statement(s) to the contrary, it will be presumed the the application filed in the PTO is the application which the inventor(s) executed by signin the oath or declaration." Notice of July 13, 1995 (1177 O.G. 60).	menore se	are acceptable as minimums for identifying a specification and compilance with any one of the item below will be accepted as complying with the identification requirement of 37 CFR 1.63:
"(3) name of inventor(s) and attorney docket number which was on the specification as filled "(4) name of inventor(s), title which was on the specification as filled and filling date; "(5) name of inventor(s), title which was on the specification as filled and reference to a attached specification which is both attached to the oath or declaration at the time of executio and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filled and accompanied b a cover letter accurately identifying the application for which it was intended by either th application number (consisting of the series code and the serial number; e.g.,081/12,455), c serial number and filling date. Absent any statement(s) to the contrary, it will be presumed the the application filed in the PTO is the application which the inventor(s) executed by signin, the oath or declaration." Notice of July 13, 1995 (1177 O.G. 60). (c) Uses described and claimed in PCT International Application No	90	
"(4) name of inventor(s), title which was on the specification as filed and filing date; "(5) name of inventor(s), title which was on the specification as filed and reference to a attached specification which is both attached to the cath or declaration at the time of executio and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filed and accompanied b a cover letter accurately identifying the application for which it was intended by either th application number (consisting of the series code and the serial number; e.g., 04/123,456), serial number and filing date. Absent any statement(s) to the contrary, it will be presumed the the application filed in the PTO is the application which the inventor(s) executed by signin the cath or declaration." Notice of July 13, 1995 (1177 O.G. 60).		"(2) name of inventor(s), serial number and filing date:
"(5) name of inventor(s), title which was on the specification as filed and reference to a attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filed and accompanied be a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123,456), serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration." Notice of July 13, 1995 (1177 O.G. 60).		
attached specification which is both attached to the oath or declaration at the time of executic and submitted with the oath or declaration; or "(6) name of inventor(s), title which was on the specification as filed and accompanied be a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g.,08/123,456), serial number and filing date. Absent any statement(s) to the contrary, it will be presumed the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration." Notice of July 13, 1995 (1177 O.G. 80). The contraction of the contractional Application Not filed on and a serial number and supplication.		
a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, application number and filing date. Absent any statement(s) to the contrary, it will be presumed the the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.* Notice of July 13, 1995 (1177 O.G. 60). (c) Was described and claimed in PCT International Application Not filed on and a		attached specification which is both attached to the oath or declaration at the time of execution
(c) was described and claimed in PCT International Application No		a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123, 456, common and illing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing
filed on and a	**	Notice of July 13, 1995 (1177 O.G. 60).
amended under PCT Article 19 on (if any).	(c) 🗆	filed on and a
		amended under PCT Article 19 on (if any).
		9.7

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

- and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
 - in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.96.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)–(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (ej)

- (d) no such applications have been filed.
- (e) 🛮 such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

(Declaration and Power of Attorney [1-1]-page 3 of 7)

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
Australia	PO3017	16 Oct 1996	YES NO [
		4-1	☐ YES NO □
	763		☐ YES NO ☐
			☐ YES NO ☐
			☐ YES NO ☐

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S) (34 U.S.C. § 119(e))

I hereby claim the benefit under Title 35, United States Code, \S 119(e) of any United States provisional application(s) listed below:

PROVISIONA	L APPLICATION NUMB	FILING DATE	
/_			
/			
/			

CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S) UNDER 35 U.S.C. 120

The claim for the benefit of any such applications are set forth in the
attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF
ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN
PART (C-LP) APPLICATION

(Declaration and Power of Attorney [1-1]-page 4 of 7)

ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Richard A. Bachand, #25,107 Carol W. Burton, #35,465 William W. Cochran, #26,652 Earl C. Hancock, #19,472

Homer L. Knearl, #21,197 James A. Pinto, #P40,774 William J. Kubida, #29,664 Andrew D. Sorensen, #33,606

Stuart T. Langley, #33,940 Lee R. Osman, #38,260 John R. Wahl, #33,044

(check the following item, if applicable)

Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

Denver, CO 80201-8749

DIRECT TELEPHONE CALLS TO: (Name and telephone number)

Andrew D. Sorensen Holland & Hart LLP 555 17th Street, Suite 3200 P. O. Box 8749

Andrew D. Sorensen Telephone: (303) 295-8194 Facsimile: (303) 295-8261

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(Declaration and Power of Attorney [1-1]-page 5 of 7)

SIGNATURE(S)

Shane	first inventor Douglas HOLLIS
(GIVEN NAME)	(MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)
Inventor's signature.	
Date	Country of Citizenship Australia
Residence	Denistone, New South Wales, Australia
Post Office Address	12 Ellen Street
Fost Office Address	Denistone, New South Wales 2112
	AUSTRALIA
nventor's signature .	
Inventor's signature	
	Country of Citizenship
Date	Country of Citizenship
Date	
Date	
Date	
Date Residence Post Office Address	
Date Residence Post Office Address	
Date Residence Post Office Address	
Date	int inventor, if any
Post Office Address Full name of third joi (GIVEN NAME) Inventor's signature	int inventor, if any (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)
Pate	int inventor, if any (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

(Declaration and Power of Attorney [1-1]—page 6 of 7)

	(check proper box(es) for any of the following added page(s) that form a part of this deciaration)
	Signature for fourth and subsequent joint inventors. Number of pages' added
	Signature by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added
	Sec. 2
	Signature for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. Number of pages added
	* * £
	Added page for signature by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)
	v S v 3 v . 2
	Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.
	□ Number of pages added
	Authorization of attorney(s) to accept and follow instructions from representative.
	• • •
	· · · · · · · · · · · · · · · · · · ·
t	(if no further pages form a part of this Declaration, then end this Declaration with this page and check the following item)
	This declaration ends with this page.

Attorney Docket No. 38730.830025.00
Express Mail Label No. EM532283284U

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Examiner:

Serial No.

Art Unit:

Filed: HEREWITH

For: VENT VALVE APPARATUS

CERTIFICATE OF MAILING BY EXPRESS MAIL

Box PATENT APPLICATION Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the attached New Application Transmittal; Specification, Claims and Abstract; Three (3) Sheets of Formal Drawings; Combined Declaration and Power of Attorney (unsigned); Return Card; and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail," Mailing Label No. EM532283284US with the U.S. Postal Service, addressed to Box Patent Application, Assistant Commissioner for Patents, Washington, D.C., 20231, on this 16th day of October, 1997.

October 16, 1997

valeril HBrown

Mailer

October \ . 1997

Andrew D. Sorensen, Reg. No. 33,606

Attorney for Applicant
HOLLAND & HART LLP
555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8194

Facsimile: (303) 295-8261

HH:797444 v1



UNITED & 12S DEPARTMENT OF PATENTS AND TRADEMARKS Washington, D.C. 20231 ES DEPARTMENT OF COMMERCE

				- 1	
	APPLICATI	ON NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO./TITLE
08/951	,357	10/16/97	HOLLIS	S	38730.830026

0222/0209

ANDREW D SORENSEN HOLLAND & HART 555 17TH STREET SUITE 3200 P 0 BOX 8749 DENVER CO 80201-8749

NOT ASSIGNED .

3312

S

DATE MAILED:

02/09/98

38730.830026

NOTICE TO FILE MISSING PARTS OF APPLICATION Filing Date Granted

any fees required above to avoid abandonment. Extensions of time may be obtained by filling a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

tee and the provisions of or a reference.	
If all equired items on this form are filed within the period set above, the total amount owed by applicant ⊕large entity □ small entity (verified statement filed), is \$	as a
1. The statutory basic filing fee is:	
© missing. □ insufficient. 4.67	
Applicant must submit \$ 790 to complete the basic filing fee and/or file a verified small e	entity
statement claiming such status (37 CFR 1.27).	uy
2. Additional claim fees of \$ 1/0 , including any multiple dependent claim fees, are required	§
Applicant must either submit the additional claim fees or cancel additional claims for which fees are due.	
☐ 3. The oath or declaration:	
is missing.	
 does not cover the newly submitted items. does not identify the application to which it applies. 	
☐ does not include the city and state or foreign country of applicant's residence.	
An oath or declaration in compliance with 37 CFR 1. 63, including residence information and identifying the above Application Number and Filing Date is required.	e application by
4. The signature(s) to the oath or declaration is/are:	2.0
Emissing.	34
by a person other than inventor or person qualified under 37 CFR 1.42, 1.43, or 1.47. A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the ab	nove
Application Number and Filing Date, is required.	
☐ 5. The signature of the following joint inventor(s) is missing from the oath or declaration:	
An oath or declaration listing the names of all inventors and signed by the omitted inventor(s), identifying the above Application Number and Filing Date, is required.	his application by
☐ 6. A \$ processing fee is required since your check was returned without payment (37 CFR	1,21(m)).
7. Your filing receipt was mailed in error because your check was returned without payment.	
 8. The application does not comply with the Sequence Rules. See attached "Notice to Comply with Sequence Rules 37 CFR 1.821-1.825." 	
□ 9. OTHER:	
Direct the response and any questions about this notice to "Attention: Box Missing Parts."	
A copy of this notice <u>MUST</u> be returned with the response.	
Gustomer Service Center Initial Patent Examination Division (703) 308-1202	119
HILLET MOTE ENGINEERING FINANCE (1.50) 555 122	
FORM PTO-1533 (REV.7-96) PART 1-ATTORNEY/APPLICANT COPY	*U.S. GPO: 1998-404-498/40515



#4

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263015979US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit:

3312

TRANSMITTAL OF MISSING PARTS

Box MISSING PARTS Assistant Commissioner of Patents Washington, D.C. 20231

Sir:

In response to Notice to File Missing Parts of Application, enclosed are the following:

- 1. Combined Declaration and Power of Attorney.
- 2. Verified Statement Claiming Small Entity Status.
- 3. Copy of Notice to File Missing Parts of Application.
- Check in the amount of \$515.00 (\$1,030.00 reduced by half for small entity status).

The Commissioner is hereby authorized to charge any deficiencies in the above-noted fees to Deposit Account No. 08-2623.

Respectfully submitted,

April , 1998

Andrew D. Sorensen, Reg. No. 33,606 Attorney for Applicant

HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8194

Facsimile: (303) 295-8261

HH:834967 v1



PATENT

Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263015979US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

VENT VALVE APPARATUS

Examiner:

Art Unit:

3312

CERTIFICATE OF MAILING BY EXPRESS MAIL

Box MISSING PARTS Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed CERTIFIED COPY OF PRIORITY DOCUMENT (Australia Application No. PO 3017); TRANSMITTAL OF MISSING PARTS; COMBINED DECLARATION AND POWER OF ATTORNEY; VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS; COPY OF NOTICE TO FILE MISSING PARTS; CHECK IN THE AMOUNT OF \$515.00; RETURN CARD; AND THIS CERTIFICATE OF MAILING BY EXPRESS MAIL relating to the above application, were deposited as "Express Mail," Mailing Label No. EM263015979US with the United States Postal Service, addressed to Box MISSING PARTS, Assistant Commissioner of Patents, Washington, D.C. 20231, on this 9th day of April, 1998.

April 9, 1998

April 1998

04/14/1998 AHAYES 00000004 08951357 01 FC:201 395 02 FC:205 65 03 FC:203 55

Andrew D. Sorensen, Reg. No. 33,606

Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200 P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8194

Facsimile: (303) 295-8261

DENVER:0834967.01





Attorney's Docket No. 38730.830026.000

PATENT

COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL, CONTINUATION OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item b	<i>pelow</i>
------------------------------	--------------

	(crieck one applicable item below)
×	original.
	design.
	supplemental.
	f the declaration is for an International Application being filed as a divisional, continuation of ontinuation of ontinuation-in-part application, do <u>not</u> check next item; check appropriate one of last three items.
	national stage of PCT.
	f one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL CONTINUATION OR C-I-P.
	divisional.
	continuation.
	continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

70 30	VENT	VALVE	APPARATUS	18 ay

(Declaration and Power of Attorney [1-1]-page 1 of 7)

SPECIFICATION IDENTIFICATION

the specification of which:
(complete (a), (b) or (c))
(a) is attached hereto.
NOTE: "The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and complian with any one of the items below will be accepted as complying with the identification requirement 37 CFR 1.63:
"(1) name of inventor(s), and reference to an attached specification which is both attach to the oath or declaration at the time of execution and submitted with the oath or declaration filing;
"(2) name of inventor(s), and attorney docket number which was on the specification as file or
"(3) name of inventor(s), and title which was on the specification as filed."
Notice of July 13, 1995 (1177 O.G. 60). (b) Was filed on October 16, 1997 as Serial No. 0 8/ 951,35
or □ and was amended on (if applicable).
NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter a not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involve are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. So 37 CFR 1.67.
NOTE: "The following combinations of information supplied in an oath or declaration filed after the filing da are acceptable as minimums for identifying a specification and compliance with any one of the item below will be accepted as complying with the identification requirement of 37 CFR 1.63:
 (1) name of inventor(s), and application number (consisting of the series code and the ser number; e.g.,08/123,456);
"(2) name of inventor(s), serial number and filing date;
"(3) name of inventor(s) and attorney docket number which was on the specification as file
"(4) name of inventor(s), title which was on the specification as filed and filing date;
"(5) name of inventor(s), title which was on the specification as filed and reference to a attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or
"(6) name of inventor(s), title which was on the specification as filed and accompanied to a cover letter accurately identifying the application for, which it was intended by either the application number (consisting of the series code and the serial number, e.g.,08/123,456), serial number and filing date. Absent any statement(s) to the contrary, it will be presumed the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."
Notice of July 13, 1995 (1177 O.G. 60).
(c) was described and claimed in PCT International Application No.
amended under PCT Article 19 on (if any).
±

53

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

X	and which is material to the examination of this application, namely, information
883	where there is a substantial likelihood that a reasonable Examiner would consider
	it important in deciding whether to allow the application to issue as a patent,
	and

in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.96.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)–(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d)	по	such	applications	have	been	filed.

(e) Such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter/the details below and make the priority claim.

(Declaration and Power of Attorney [1-1]-page 3 of 7)

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)–(d)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
Australia	PO3017	16 Oct 1996	¥YES NO□
			☐ YES NO ☐
	*		☐ YES NO ☐
			☐ YES NO ☐
		<u> </u>	☐ YES NO □

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S) (34 U.S.C. § 119(e))

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE
/	239
	_

CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S) UNDER 35 U.S.C. 120

☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN PART (C-I-P) APPLICATION.

(Declaration and Power of Attorney [1-1]-page 4 of 7)

ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

NOTE: If the application filed more than 12 months from the filling date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Richard A. Bachand, #25,107 Carol W. Burton, #35,465 William W. Cochran, #26,652 Earl C. Hancock, #19,472 Homer L. Knearl, #21,197 William J. Kubida, #29,664

James A. Pinto, #P40,774
Andrew D. Sorensen, #33,606
John R. Wahl, #33,044

Stuart T. Langley, #33,940 Lee R. Osman, #38,260

(check the following item, if applicable)

Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO: (Name and telephone number)

Andrew D. Sorensen
Holland & Hart LLP
555 17th Street, Suite 3200
P. O. Box 8749
Denver, CO 80201-8749

Andrew D. Sorensen Telephone: (303) 295-8194 Facsimile: (303) 295-8261

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(Declaration and Power of Attorney [1-1]-page 5 of 7)

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filling receipt and all other documents. Full name of sole or first inventor HOLLIS Shane Douglas FAMILY (OR LAST NAME) (GIVEN NAME) Inventor's signature Date 27/11/97 Australia Country of Citizenship Denistone, New South Wales, Australia Residence _ 12 Ellen Street Post Office Address Denistone, New South Wales 2112 AUSTRALIA Full name of second joint inventor, if any (GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME) Inventor's signature Country of Citizenship Date _ Residence _ Post Office Address. Full name of third joint inventor, if any (GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME) Inventor's signature Date _ Country of Citizenship Residence _ Post Office Address

(Declaration and Power of Attorney [1-1]-page 6 of 7)

	(check proper box(es) for any of the following added page(s) that form a part of this deciaration)
	Signature for fourth and subsequent joint inventors. Number of pages added
	• • • • • • • • • • • • • • • • • • • •
	Signature by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added
	* * * *
	Signature for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. Number of pages added
	® • . • .
	Added page for signature by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)
	* * *
	Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.
	□ Number of pages added
	e * ×
- 5	* * *
	Authorization of attorney(s) to accept and follow instructions from representative.
	* * *
t	(if no further pages form a part of this Declaration, then end this Declaration with this page and check the following item)
	This declaration ends with this page.



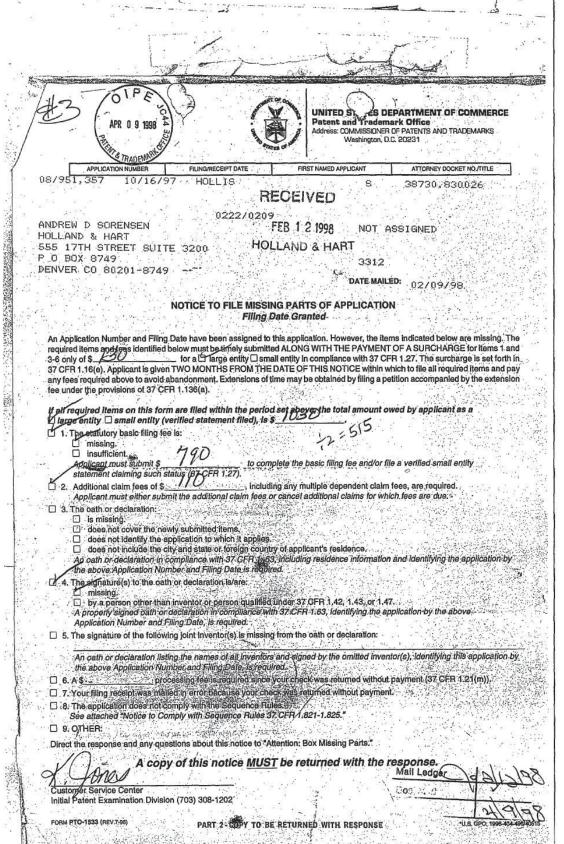
Attorney's Docket I	No. 38730.83002	6.000	PATENT
200	Douglas HOLLIS		
Applicant Stratte		Patent No	
		Issued on	
	VENT VALVE APP		
	TATEMENT CLAIMI .9(f) and 1.27(c))—SM		
	f the small business co	ncem identified helo	w.
an official of concern iden	f the small business contified below: .		o act on behalf of the
Name of Small Busines	s Concern	2 Waterloo Ro	-d
Address of Small Busin	less Concern	2 Waterioo Ro	w South Wales 211
Sections 41(a) and (b) of the concern, includin of this statement, (1) the the previous fiscal year or temporary basis duri affiliates of each other power to control the ot both.	g those of its affiliates, of a number of employees of the concern of the ng each of the pay peri when either, directly or her, or a third-party or p	es Code, in that the loes not exceed 500 of the business concer persons employed or ods of the fiscal year indirectly, one conce- parties controls or ha	number of employees persons. For purposes erm is the average over in a full-time, part-time in, and (2) concerns are ern controls or has the is the power to control
I hereby declare that with, the small busines in	rights under contract of s concern identified about	or law have been con ove, with regard to the	nveyed to, and remain ne invention described
	ation filed herewith, with	title as listed above	h.
the applicati	on identified above.	,	
the patent in	dentified above.		
individual, concern or or rights to the invention are as an independent invention.	e above identified small organization having right re held by any person, ot intor under 37 CFR 1.9(ald not qualify as a sma or under 37 CFR 1.9(e).	its in the invention is her than the inventor, c), if that person mad	is listed below* and no who would not qualify de the invention, or by
*NOTE: Separate verified	statements are required from	each named person, con	cern or organization having

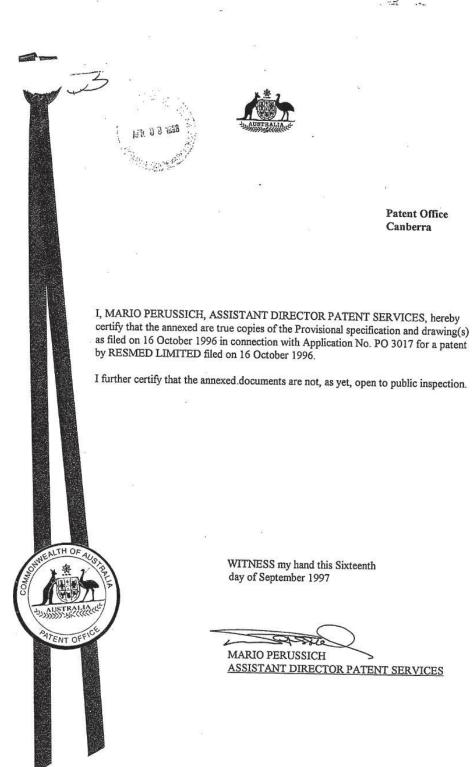
(Small Entity-Small Business [7-4]-page 1 of 2

L			Oli Having	g any rigino	in the miver	ntion is listed
/		concern, or org			eledos B razinatas do	
☐ Eac	th such perso	n, concern or o	rganizatio	on is listed t	below.	
Name						
Address						77
□ INDIVIDUA	и	SMALL BUSINESS	CONCERN		NONPROFIT	ORGANIZATION
Name						
Address				-27 MH 1724 — 2000-3		
☐ INDIVIDUA	L D	SMALL BUSINESS	CONCERN		NONPROFIT	ORGANIZATION
I hereby dec all statements statements we are punishable States Code, application, ar directed.	nall business lare that all st made on infor re made with by fine or imp and that suc ny patent issu	entity is no long tatements made mation and belie the knowledge the prisonment, or be the willful false st ining thereon, or	herein of f are belie nat willful f oth, under tatements any pater	my own knowed to be to false statem Section 100 s may jeopa nt to which	OFR 1.28(b)) owledge are ue; and furth ents and the of Title 18 ardize the v	true and that er, that these like so made of the United alidity of the
Name of Person	on Signing	DR C. G	15000	2013		
Title of Person		n Owner <u>81</u>	rloo 1	Road		
Address of Pe	rson Signing	North H	Rvde. 1	New Sout	h Wales	2113
Address of Pe	rson əigililig	North I		New Sout	h Wales	2113

(Small Entity-Small Business [7-4]-page 2 of 2

BEST COPY







S & F Ref: 341000

ORIGINAL

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

A Vent Valve Apparatus

Name and Address of Applicant:

ResMed Limited, an Australian company, ACN 003 765 142, of 82 Waterloo Road, North Ryde, New South Wales, 2113, AUSTRALIA

This invention is best described in the following statement:

5805

A VENT VALVE APPARATUS

The present invention relates to a vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal.

5

The invention has been developed primarily for use in controlling the venting of washout gas in a continuous positive airway pressure (CPAP) gas delivery systems used, for example, in the treatment of obstructive sleep apnea (OSA) and similar sleep disordered breathing conditions. The invention may also be used in conjunction with suitable mask and gas delivery system for the application of assisted ventilation treatment.

The term "mask" is herein intended to include face masks, nose masks, mouth masks, appendages in the vicinity of any of these masks and the like.

Treatment of OSA by CPAP flow generator systems involves the continuous delivery of air (or breathable gas) pressurised above atmospheric pressure to a patient's airways via a conduit and a mask. CPAP pressures of 4 cm H₂O to 22 cm H₂O are typically used for treatment of sleep disordered breathing due to OSA and or central apnea, depending on patient requirements.

Treatment pressures for assisted ventilation can range up to 32 cm $\rm H_2O$ and beyond, depending on patient requirements.

For either the treatment of OSA or the application of assisted ventilation, the pressure of the gas delivered to patients can be constant level, bi-level (in synchronism with patient inspiration and expiration) or autosetting in level. Throughout this specification the reference to CPAP is intended to incorporate a reference to any one of, or combinations of, these forms of pressure delivery.

The prior art method for providing CPAP treatment includes a vent for gas washout of the gas flow. The vent is normally located at or near the mask or in the gas delivery conduit. The flow of gas through the vent is essential for removal of exhaled gases from the breathing circuit. Adequate gas washout is achieved by selecting a vent size and configuration that will allow a minimum safe gas flow at the lowest operating CPAP pressure, which, typically can be as low as, around 4 cm H₂O for adults and 2 cm H₂O in paediatric applications.

Existing vent configurations include single or multiple holes, foam diffusers, slots and combinations thereof. A reference herein to a vent may be understood to include a reference to one or more holes, foam diffusers, slots or any combination of them.

The flow of gas from the gas delivery system through the vent to atmosphere creates noise as the delivered gas, and upon expiration the patient expired gas including CO₂, passes through the vent. Increasing CPAP pressure results in more gas passing

(N:\LIBD]00044:CMS

through the vent which in turn creates more noise. Existing prior art vents produce excessive noise when CPAP pressures are raised above about 4 cm $\rm H_2O$. This noise can adversely affect patient and bed-partner comfort. Existing vents are also inefficient as they allow more gas through the vent than is required for adequate exhaust gas washout and thereby require the flow generator to provide more flow than is necessary in order to maintain the required treatment pressure. Further, where treatment gas is being supplied, such as oxygen, surplus treatment gas is vented and thereby wasted unnecessarily. A similar waste occurs where the supplied gas is humidified.

It is an object of the present invention to overcome or at least ameliorate one or more of these deficiencies of the prior art.

Accordingly, the invention provides a vent valve apparatus for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂ gas through the washout vent over a range of gas supply pressures.

Preferably, the system supplies breathable gas to a human patient.

The breathable gas is desirably air.

20

30

In an embodiment of the invention, the gas washout vent consists of an orifice having the shape of a outwardly diverging truncated cone and the vent valve is in the form of a similarly cone shaped plug. The rim of the cone shaped orifice acts as a valve seat for the cone shaped plug.

Desirably, the pressure sensitive vent valve control means includes an elastic diaphragm connected to the vent valve such that displacement of the diaphragm results in displacement of the vent valve. In an embodiment, the diaphragm is produced from rubber or other elastic diaphragm stretched over a circular orifice. The vent valve is preferably connected to the rubber by a mechanism that allows for the stroke of the vent valve to be adjusted.

The vent valve is desirably attached to the centre of the rubber diaphragm by a connection means such as a rod, the rod being operatively connected to both the vent valve and the diaphragm.

In a preferred embodiment, the vent valve and diaphragm are directly connected by the rod. The rod is preferably rigid, such that movement of the diaphragm is directly proportional to the movement of the vent valve.

In another embodiment, the connection means include a lever assembly connecting the vent valve to the diaphragm so as to permit differing ratios of movement and mechanical advantage of the vent valve relative to the diaphragm.

N:\LIBD]00044:CMS

-

Such an assembly can include a tension means that opposes the movement of the diaphragm caused by increasing gas supply pressure so as to bias the vent valve to a position where the flow area of the orifice is maximised.

It will be understood that the orifice covered by the diaphragm need not be circular and can be any convenient shape.

In one preferred configuration, the vent valve apparatus is provided in a branch connection from a mask. In another preferred configuration, the vent valve apparatus is provided in an air supply conduit substantially adjacent the mask.

In a further embodiment, the vent valve apparatus includes an aerodynamic member such an aerofoil or wing. The member is disposed in the air supply conduit by a biased pivot mechanism and has an axis of rotation transverse to the direction of gas flow. Gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of the gas flowing through the conduit. As the gas velocity increases the aerodynamic member produces increased lift and the resulting rotational displacement is transmitted to the vent valve which restricts the flow area of the washout vent. The vent valve is preferably biased open to a maximum washout vent flow area by a tension means such as a spring.

In a further preferred embodiment an aerodynamic member is suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch. Rotation around the axis is in response to the gas flow, which is proportional to the pressure in the conduit. The member is connected to the vent valve such that as the pressure in the conduit increases the rotational displacement of the aerodynamic member causes corresponding movement of the vent valve, resulting in a reduction of the flow area of the washout vent. A tension means is adapted to bias the vent valve, such as a spring, operates on the aerodynamic member to oppose the rotation caused by the gas flow on the aerodynamic member. The tension means biases the aerodynamic member in a rotational direction opposite to the direction induced by the gas flow entering the branch from the conduit.

Preferred embodiments of the invention will now be described, by way of examples only, with reference to the accompanying drawings in which:

Figure 1 is a schematic sectional side view of a vent valve apparatus according to the first embodiment of the invention;

Figure 2 is a schematic sectional side view of a vent valve apparatus according to a second embodiment of the invention; and

Figure 3 is a schematic sectional side view of a vent valve according to a third embodiment of the invention.

35

Referring to Figure 1 there is shown a vent valve apparatus 10 according to a first embodiment of the invention. The vent valve apparatus 10 is connected to a mask (not shown) at 12. The mask is adapted to receive a continuous supply of gas 13 above

[N:\LIBD|00044:CMS

atmospheric pressure from a flow generator (not shown) through a flexible conduit 14. The apparatus 10 includes a gas washout vent, in the form of a substantially conical orifice 15 formed in a wall 16 of the pipe branch 17, and a vent valve in the form of a substantially conical plug 18. The rim 19 of the orifice 15 acts as a valve seat for the plug 18. The apparatus 10 also includes a pressure sensitive vent valve control means which includes an elastic diaphragm 20 stretched over an circular orifice 22 of the branch 17, and a rigid wire rod 23 connecting the plug 18 to the centre of the diaphragm 20.

The orifice 15 provides an outlet for the removal of gas upon patient expiration. Gas removal is aided by the continuous flow of gas pressurised above atmospheric pressure flowing through the conduit 14 and to atmosphere through the orifice 15.

As the air pressure in conduit 14 increases, corresponding increases occur in the air pressure adjacent diaphragm 20. These pressure increases cause diaphragm 20 to bulge to the position represented by phantom line 26. The displacement of the centre of the diaphragm 20 results in corresponding displacement in the plug 18, causing the plug 18 to be drawn into the orifice 15 thereby restricting the flow of gases through the vent orifice. In this way, the flow area of the vent is restricted at higher delivery pressures thereby reducing flow of gas through the orifice 15 compared to a fully open orifice.

The apparatus can be calibrated by adjusting the length of the wire rod 23 between the plug 18 and the diaphragm 20.

20

30

The vent valve apparatus 10 thereby maintains the airflow through the vent at, or at least near, the optimum safe minimum amount. This has the effect of reducing the noise produced at higher CPAP pressures, compared to the noise emitted by a similar orifice without the vent valve. A quieter vent improves patient and bed-partner comfort. An additional benefit provided by the invention is the reduction in the amount of wasted gas forced through the vent unnecessarily at higher CPAP treatment pressures.

A prototype of the first embodiment of the invention shown in Figure 1 has been tested over a range of CPAP treatment pressures utilising the present applicant's SullivanTM V flow generator made by ResMed Limited and SullivanTM mask frame (fitted with Series 3 SullivanTM Bubble CushionTM) modified in accordance with the teaching of this invention. This prototype was also tested without the conical plug 18. The results of the tests are summarised in the table below.

[N:\LIBD]00044:CMS

TABLE 1

rei		parison for Prototyp n and Without the C		Apparatus
CPAP Pressure	With		Without	
cmH20	Air Flow	Sound Pressure	Air Flow	Sound Pressure
	1/m	Level dB(A)	1/m	Level dB(A)
4	11.2	34.1	11.9	36.1
10	14.4	46.8	19.5	48.4
18.5	9.0	52.7	26.7	55.7

As the results show, the prototype vent valve according to the first embodiment of the invention maintained a substantially constant air flow through the vent over a wide range of CPAP treatment pressures compared to the large variation exhibited by a similar mask without the conical plug. Further, at all pressures, the noise produced by the mask using the vent valve apparatus according to the first embodiment of the invention was less than the same mask without the conical plug.

Referring now to Figure 2, there is shown a vent valve apparatus according to a second embodiment of the invention. Like reference numerals to those used in Figure 1 will be used to indicate like features in Figure 2. This second embodiment functions in the same way as the first embodiment in that an increases in pressure in the conduit 14 causes the diaphragm 20 to bulge and draw the plug 18 into the washout valve orifice 15, thereby restricting the flow of gas through that orifice.

10

A third embodiment of the present invention is shown in Figure 3. Once again, like reference numerals are used to indicate like features. This third embodiment includes an aerodynamic member, in the form of wing 30, which is disposed in conduit branch 17 and adapted to pivot about an axis transverse to the direction of the gas flow along the conduit branch 17. The wing 30 is connected to a pivot mechanism, indicated generally at 31, which includes a connecting rod 33 and pivot joint 34. The connecting rod 33 and pivot joint 34 is operatively connects the plug 18 to the wing 30. A spring 36 is used to bias the wing 30 and plug 18 to a position where the flow area of orifice 15 is maximized. As gas supply 13 is forced through the conduit 14, branch 17 and over the wing 30, the wing generates lift which opposes the spring and causes displacement of the wing to the position shown by phantom line 37, thereby drawing plug 18 into orifice 15 as shown by phantom line 32 and, thereby reducing the flow area of the gas washout orifice 15. Accordingly, the higher the pressure and flow rate

[N:\LIBDJ00044:CMS

of air passing through the branch 17 of the conduit 14, the more lift is produced by the wing and the more the flow area of the washout vent orifice 15 is restricted.

As with the earlier embodiments described above, this maintains a substantially constant air flow through the washout vent orifice.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

DATED this Sixteenth Day of October 1996

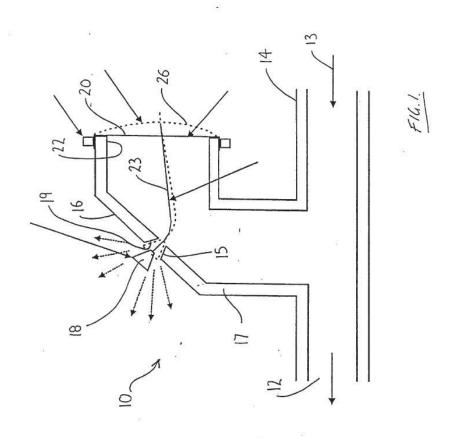
ResMed Limited

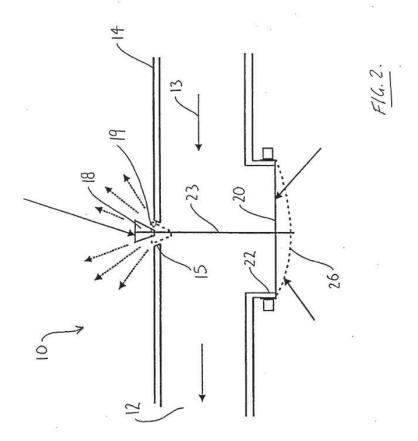
Patent Attorneys for the Applicant/Nominated Person

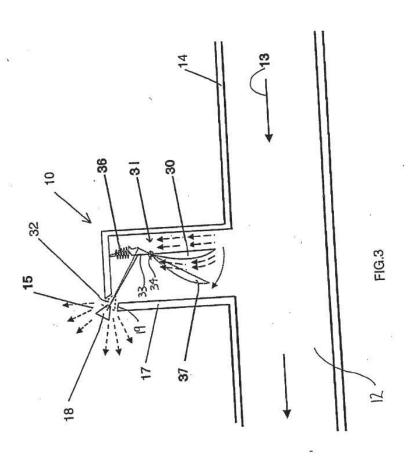
SPRUSON & FERGUSON

10

N:\LIBD]00044:CMS







05/13/98

3738

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263017691US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

3738

Art Unit:

_ M

MAY 1 5 1998

CERTIFICATE OF MAILING BY EXPRESS MAIL

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed Information Disclosure Statement; Form PTO-1449; Copies of Cited References; Return Card; and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail," Mailing Label No. EM263017691US with the United States Postal Service, addressed to Assistant Commissioner of Patents, Washington, D.C. 20231, on this 13 day of May 1998.

May 13, 1998

vallrie pBrown

Mailer

May 13, 1998

Andrew D. Sorensen, Registration No. 33,606

for HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8194 Facsimile: (303) 295-8261

DENVER:0842100.01



PATENT

Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263017691US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit:

3312

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

MAY 1 5 1998 GROUP 32 TO

Pursuant to 37 C.F.R. § 1.97 the Examiner may wish to consider the references listed on the attached Form PTO-1449. In submitting these references for the Examiner's consideration, no representation is made or implied that the references are or are not material to the examination of the application. The Examiner is encouraged to make his or her own determination of materiality. A copy of the references are provided.

This Information Disclosure Statement is being filed pursuant to 37 C.F.R. § 1.97(b), before issuance of a first office action in the case. Thus no petition fee is believed required. However, any fees associated with this communication may be made to Deposit Account No. 08-2623.

Respectfully submitted,

May 13, 1998

Andrew D. Sorensen, Reg. No. 33,606 for Holland & Hart LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8194

Facsimile: (303) 295-8261

DENVER:0842100.01

Sheet 1 of 5

BORM PTO-1449 U.S. DEPARTMENT OF COMMERCE OGIFIED PATENT AND TRADEMARK OFFICE OF INFORMATION DISCLOSURE

ATTY. DOCKET NO. 38730.830026.000 APPLICANT: Shane Douglas HOLLIS SERIAL NO. 08/951,357_

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use several sheets if necessary)

FILING DATE October 16, 1997

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
1, w, A	2,123,353	07/12/38	Catt	1	~	
11	2,254,854	09/02/41	O'Connell	/	-	
	2,931,356	04/05/60	Schwarz	F:	j	
	Des. 188,084	05/31/60	Garelick		. —	
	2,939,458	06/07/60	Lundquist			
	3,315,674	04/25/67	Bloom et al.		-Air	
	3,330,273	07/11/67	Bennett		MAY	
	Des. 231,803	06/11/74	Huddy		1	5 1999
	Des. 250,131	10/31/78	Lewis et al.		CALLY.	
	4,167,185	09/11/79	Lewis			Meiligh
	Des. 262,322	12/15/81	Mizerak			
	4,328,797	05/11/82	Rollins, III et al.			
	4,354,488	10/19/82	Bartos		~	
	4,402,316	09/06/83	Gadberry		-	
	4,655,213	04/07/87	Rapoport et al.	,	`	
	4,665,570	05/19/87	Davis	_		
,	4,677,977	07/07/87	Wilcox		·~	
	4,686,974	08/18/87	Sato et al.			
	Des. 293,613	01/05/88	Wingler		,	
	4,770,169	09/13/88	Schmoegner et al.		-	
	4,782,832	11/08/88	Trimble et al.	T		
	4,848,334	07/18/89	Bellm	-		
1	4,907,584	03/13/90	McGinnis	-		
	4,913,401	04/03/90	Handke	-		
	4,938,212	07/03/90	Snook et al.	·		
	4,944,310	07/31/90	Sullivan	-	_	N. Contraction
6	Des. 310,431	09/04/90	Bellm	T		
w A	4,971,051	11/20/90	Toffolon			

Sheet 2 of 5

U.S. PATENT DOCUMENTS (Continued)

EXAMINER	PATENT	ISSUE		CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
INITIAL	NUMBER	DATE	PATENTEE	CLASS	SUBULASS	AFFROFRIATE
cours	4,989,599	02/05/91	Carter			
	5,005,571	04/09/91	Dietz			
	5,009,635	04/23/91	Scarberry			
	5,024,219	06/18/91	Dietz	-		
	5,038,776	08/13/91	Harrison et al.	$\perp =$		
	5,065,756	11/19/91	Rapoport			-
	5,117,819	06/02/92	Servidio et al.			
	5,134,995	08/04/92	Gruenke et al.			
	5,148,802	09/22/92	Sanders et al.			
	5,161,525	11/10/92	Kimm et al.		100	-
	5,199,424	04/06/93	Sullivan et al.			AV a n
	5,203,343	04/20/93	Axe et al.		19/	1 5 1548
	5,231,979	08/03/93	Rose et al.		1 to 100	
	5,239,995	08/31/93	Estes et al.			
	5,243,971	09/14/93	Sullivan et al.	 		
	5,245,995	09/21/93	Sullivan et al.		~	
	5,259,373	11/09/93	Gruenke et al.		-	
	5,271,391	12/21/93	Graves			
	5,313,937	05/24/94	Zdrojkowski			
	5,335,654	08/09/94	Rapoport	T	-	9
	5,343,878	09/06/94	Scarberry et al.	- <u>-</u> -	T	
	5,353,788	10/11/94	Miles	·	-	
	5,429,683	07/04/95	Le Mitouard		T.—	
	5,433,193	07/18/95	Sanders et al.	-	-	
	5,438,981	08/08/95	Starr et al.		- ,	
	5,441,046	08/15/95	Starr et al.	-		
-	5,443,061	08/22/95	Champain et al.		·	
+	Des, 362,061	09/05/95	McGinnis et al.		,—,	
	5,458,137	10/17/95	Axe et al.			
+	5,477,852	12/26/95	Landis et al.	7		
a.w.A	5,490,502	02/13/96	Rapoport et al.	1-		



U.S. PATENT DOCUMENTS (Continued)

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
w.A.	5,492,113	02/20/96	Estes et al.		—	
	5,492,116	02/20/96	Scarberry et al.		-	3///54
	5,501,214	03/26/96	Sabo			
	5,503,146	04/02/96	Froehlich et al.			HV
	5,517,983	05/21/96	Deighan et al.			
	5,517,986	05/21/96	Starr et al.			
	5,522,382	06/04/96	Sullivan et al.	-		
	Re. 35,295	07/16/96	Estes et al.		<u> </u>	
	5,535,738	07/16/96	Estes et al.	-	—	
	5,635,739	07/16/96	Rapoport et al.		- Di	
	5,537,997	07/23/96	Mechlenburg et al.		- BE-1-6	
	5,540,219	07/30/96	Mechlenburg et al.		MAY 1	5 199n
	5,540,223	07/30/96	Starr et al.		GROUN	.,,
	6,546,933	08/20/96	Rapoport et al.		The state	0.00
	5,551,418	09/03/96	Estes et al.			
	5,551,419	09/03/96	Froehlich et al.]	
	Re. 35,339	10/01/96	Rapoport			MSR-48582-15508
	5,560,354	10/01/96	Berthon-Jones et al.			
	5,570,689	11/05/96	Starr et al.			2788
	Des. 377,089	12/31/96	Starr et al.		-	
	5,592,938	01/14/97	Scarberry et al.			
	5,598,838	02/04/97	Servidio et al.			
	5,632,269	05/27/97	Zdrojkowski		-	
	5,645,054	07/08/97	Cotner et al.	~	-12	
	5,647,355	07/15/97	Starr et al.			
	5,647,357	07/15/97	Barnett et al.			
-	5,655,522	08/12/97	Mechlenburg et al.		-	10000
	5,655,527	08/12/97	Scarberry et al.			
	5,657,752	08/19/97	Landis et al.	_		
werft !	5,662,101	09/02/97	Ogden et al.	-	-	

Sheet 4 of 5

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRANSLA	TION
ر.	A.						YES	NC
		WO 80/01044	05/29/80	PCT	-	_		
		WO 82/03548	10/28/82	PCT				
1-1	1	DE 3345067 A1	06/20/84	Germany				
-		GB 2 147 506 A	05/15/85	Great Britain				
11		-EP 0 171 321 A1	02/12/86	Europe				-
		WO 86/05965	10/23/86	PCT				
11	W	EP 0 252 052 A1	01/07/88	Europe	-		_	
7	M	-EP 0 264 772 A1	04/27/88	Europe		Pil-	-	
		WO 88/10108	12/29/88	PCT		MÁN	~	
		WO 90/14121	11/29/90	PCT		7-151	993	
		AU-A-62221/90	03/28/91	Australia	<u> </u>	OTO.		
1/	N	DE 4004157 C1	04/11/91	Germany			in	
0	1/2	EP 0 425 092 A1	-05/02/91	Europe				
1	IN	-EP 0-462 701 A1	-12/27/91	Europe				
		WO 92/11054	07/09/92	PCT		_		
		WO 92/20395	11/26/92	PCT				
		WO 92/22244	12/23/92	PCT				
		WO 93/01854	02/04/93	PCT				
		AU-A-33877/93	04/22/93	Australia		-		
		AU-B-59270/90	05/06/93	Australia				
		WO 93/08857	05/13/93	РСТ		-		
		WO 93/09834	05/27/93	PCT	-			7
		AU-A-38508/93	07/20/93	Australia		-		
		AU-A-48748/93	09/12/93	Australia		,		
		WO 93/21982	11/11/93	PCT		-		
		WO 93/24169	12/09/93	PCT	-	,		
U	1111-	JP 6-249742 A	09/09/94	Japan			+	
		WO 94/23780	10/27/94	PCT		\ <u> </u>		
		-EP 0 714 670 A2	12/02/94	Europe				
7		WO 95/02428	01/26/95	PCT	Ţ.,	_		
7		-EP 0 656 210 A2	00/07/95	Europe .				
	2.1.	-EP 0 661 071 A1	07/05/95	Europe				



FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION (Continued)

	DOCUMENT I NUMBER	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRANSLA	MOITA
·W.A.						YES	NO
	WO 95/32016	11/30/95	PCT	~	j		
Ma -	JP-8019840 A	01723/96	Japan	-			
	AU-A-34471/95	02/22/96	Australia				
	AU 9459430	02/29/96	Australia				
	AU-A-40711/95	04/18/96	Australia				
IM	EP 0 709 107-A1	05/01/80	Europe				
	GB 2 294 400 A	05/01/96	Great Britain	-			
	WO 96/17643	06/13/96	PCT		20/		
IM.	EP 0 747 078 A2	12/11/98	Europe		Peter y	LV	
	WO 96/39206	12/12/96	PCT ,		MAYTE	tone	
	WO 96/40337	12/19/96	PCT	(2)		278	
	WO 97/02064	01/23/97	PCT .		" alarghing	Q-Sm	
	WO 97/07847	03/06/97	PCT -				
	WO 97/10019	03/20/97	PCT				
	WO 97/10868	03/27/97	PCT		-		
1	WO 97/15343	05/01/97	PCT				
· w 1/4	EP 0 788 805 A2	08/13/97	Europe		-		-

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages etc.)

	· 	
AMINER	W. Ondors	DATE CONSIDERED
		conformance with MPEP 809; Draw line through citation if not in

DENVER:0842100.01

Sheet 1 of 4

		_	-	4
				0
	5	3	EU	UM.
	~	3	=	Шd
	-			_
	~		=	-
	0		= (2
3	0		≡.	
			2,	d
	- 84		= :	1_
	333	_	= -	,

PTO-1449 U.S. DEPARTMENT OF COMMERCE diffied) PATENT AND TRADEMARK OFFICE

ATTY, DOCKET NO. 38730.830025.000

SERIAL NO.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use several sheets if necessary) FILIN

FILING DATE HEREWITH

GROUP 35

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
C, W-11	2,123,353	07/12/38	Catt			
	2,254,854	09/02/41	O'Connell			<u> </u>
	2,931,356	04/05/60	Schwarz			
	Des. 188,084	05/31/60	Garelick			
	2,939,458	06/07/60	Lundquist			
	3,315,674	04/25/67	Bloom et al.	T		
	3,330,273	07/11/67	Bennett	,	P	
	Des. 231,803	06/11/74	Huddy			
	Des. 250,131	10/31/78	Lewis et al.		MAY 15	1999
	4,167,185	09/11/79	Lewis	1 = 0	ikoup 3	1233
	Des. 262,322	12/15/81	Mizerak		The state of the s	200
	4,328,797	05/11/82	Rollins, Ill et al.			
	4,354,488	10/19/82	Bartos			
	4,402,316	09/06/83	Gadberry		,	
	4,655,213	04/07/87	Rapoport et al.			
	4,685,570	05/19/87	Davis		~	
	4,677,977	07/07/87	Wilcox			
	4,686,974	08/18/87	Sato et al.			
	Des. 293,613	01/05/88	Wingler			1
	4,770,169	09/13/88	Schmoegner et al.			
	4,782,832	11/08/88	Trimble et al.			
	4,848,334	07/18/89	Bellm			
	4,907,584	03/13/90	McGinnis	-	~	
	4,913,401	04/03/90	Handke	·	_	
	4,938,212	07/03/90	Snook et al.			
	4,944,310	07/31/90	Sullivan			
	Des. 310,431	09/04/90	Bellm			
	4,971,051	11/20/90	Toffolon			
	4,989,599	02/05/91	Carter		-	
	5,005,571	04/09/91	Dietz	T —		
	5,009,635	04/23/91	Scarberry	·	_	
	5,024,219	06/18/91	Dietz			
	5,038,776	08/13/91	Harrison et al.		~	
¥	5,065,756	11/19/91	Rapoport			
CiwiA	5,117,819	06/02/92	Servidio et al.	,		

AMINER	PATENT	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE
3 COWA	5,134,995	08/04/92	Gruenke et al.	- CD-035	SUBULAGO	AFFROFRIATI
1	5,148,802	09/22/92	Sanders et al.	-		
	5,161,525	11/10/92	Kimm et al.			
	6,199,424	04/06/93	Sullivan et al.	+==		
-+-	5,203,343	04/20/93	Axe et al.	 		
	5,231,979	08/03/93	Rose et al.			
++-	5,239,995	08/31/93	Estes et al.	1		
	5,243,971	09/14/93	Sullivan et al.			
-					<u>;</u>	100000
\rightarrow	5,245,995	09/21/93	Sullivan et al.	1		
	5,259,373		 			
-	5,271,391	12/21/93	Graves	-		
+	5,313,937	05/24/94	Zdrojkowski		41	
	5,335,654	08/09/94	Rapoport	1	MAL	•
+-+-	5,343,878	09/06/94	Scarberry et al.	(G)	15	100
-	5,353,788	10/11/94	Miles		10:00	20
\perp	5,429,683	07/04/95	Le Mitouard			
	5,433,193	07/18/95	Sanders et al.	-		10.
	5,438,981	08/08/95	Starr et al.			
	5,441,046	08/15/95	Starr et al.	1		
	5,443,061	08/22/95	Champain et al.			
	Des. 362,061	09/05/95	McGinnis et al.			
	5,458,137	10/17/95	Axe et al.			
	5,477,852	12/26/95	Landis et al.			
	5,490,502	02/13/96	Rapoport et al.			
	5,492,113	02/20/96	Estes et al.			
	5,492,116	02/20/96	Scarberry et al.)	
	5,501,214	03/26/96	Sabo		_	
	5,503,146	04/02/96	Froehlich et al.		(
	5,517,983	05/21/96	Deighan et al.		. —	
	5,517,986	05/21/96	Starr et al.		·——	
	5,522,382	06/04/96	Sullivan et al.	-		
	Re. 35,295	07/16/96	Estes et al.		-	
	5,535,738	07/16/96	Estes et al.			
	5,535,739	07/16/96	Rapoport et al.			
	5,537,997	07/23/96	Mechlenburg et al.			
	5,540,219	07/30/96	Mechlenburg et al.			
	5,540,223	07/30/96	Starr et al.			
	5,546,933	08/20/96	Rapoport et al.	1		
4	5,551,418	09/03/96	Estes et al.	T		

MINER	PATENT	ISSUE				FILING DATE
TIAL	NUMBER	DATE	- PATENTEE	CLASS	SUBCLASS	APPROPRIAT
13.1w	Re. 35,339	10/01/96	Rapoport		1 *	
1 Crust	5,560,354	10/01/96	Berthon-Jones et al.			
LIELA	5,570,689	11/05/96	Starr et al.			
	Des. 377,089	12/31/96	Starr et al.			
	5,592,938	01/14/97	Scarberry et al.			
	5,598,838	02/04/97	Servidio et al.	_	-	
	5,632,269	05/27/97	Zdrojkowski		/	
	5,645,054	07/08/97	Cotner et al.	_	-	
	5,647,355	07/15/97	Starr et al.		15	
7	5,647,357	07/15/97	Barnett et al.		- Bick	
	5,655,522	08/12/97	Mechlenburg et al.		MAY	٠.
	5,655,527	08/12/97	Scarberry et al.	T	30-13	1998
V	5,657,752	08/19/97	Landis et al.		TOUSE,	
	5,662,101	09/02/97	Ogden et al.		- W.	-13.

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT NUMBER	PUBLISHED	COUNTRY	CLASS	SUBCLASS	TRANSLA	TION
W.H	Nomber		2.5			YEŚ	NC
7"	WO 80/01044	05/29/80	PCT		-		
	WO 82/03548	10/28/82	PCT				
1117.	U' DE 3945007 A1	00/20/84	Germany	Encharc			
	GB 2 147 506 A	05/15/85	Great Britain				
	-EP 0 171 321 A1	02/12/86	Europe .	GARRESTO		,	
	WO 86/05965	10/23/86	PCT	<u> </u>	_		134
M	-EP 0 252 052 A1	01/07/88	Europe .			_ / _	4
1111	EP 0 204 772 A1	04/27/88	Europe				
7	WO 88/10108	12/29/88	PCT	,—,			
	WO 90/14121	11/29/90	PCT				G.
	AU-A-62221/90	03/28/91	Australia			1	
	-DE-4004157-G1	04/11/91	Germany	Green Sh.		- /	
ME	EP 0 425 092 A1	05/02/91	Europe		-	1/	
THE I	-EP-0 462 701 A1	12/27/91	Europe				
	WO 92/11054	07/09/92	PCT		,	100	
	WO 92/20395	11/26/92	PCT		ļ		
	WO 92/22244	12/23/92	PCT		-		
	WO 93/01854	02/04/93	PCT		-		
	AU-A-33877/93	04/22/93	Australia				
WA	AU-B-59270/90	05/06/93	Australia				
	WO 93/08857	05/13/93	PCT				

				Tā.	88			- 1	
					(3 45)			3 1	
	120	2 (3)		. <u>.</u>	·			لخن.	144
8		100		v sa		27 Table 19		15	. 5
		5	1	/	* 500 to		·	?	
					·	Si Ja		<u> </u>	
***			Language of			and the second	1	<u>.</u>	
					27	An a			
-					<u> </u>				
		•	WO 93/09834	05/27/93	PCT	1 H	1		8
								Chant 2	-F 4
	G.							Sheet 3	01 4
7	8	· I	FOREIGN PATENT	OR PUBLISH	ED FOREIGN PATEN	T APPLICATION C	ontinued		
5	- C							TD 4 NO. 1	TION
8			DOCUMENT NUMBER	PUBLISHED DATE	- COUNTRY	CLASS	SUBCLASS	TRANSLA	ATION
	a a	1						YES	NO
		C.WAX	AU-A-38508/93	07/20/93	Australia		<u> </u>		
-	2,4		AU-A-48748/93 ·	09/12/93	Australia				
3	1	79	WO 93/21982	11/11/93	PCT				
			WO 93/24169	12/09/93	PCT		_		
	Mh	1	JP 6-249742 A	09/09/94	Japan			Wot	fore
			WO 94/23780	10/27/94	PCT		-		
Š	MA	1	EP 0 714 670 A2	12/02/94	Europe			<u> </u>	1
ē			WO 95/02428 -	01/26/95	PCT	English	1		
8	1/1	1	-EP 0 050 210 A2	00/07/95	Europe	-	_		
	N	1	-EP 0 601 071 A1	07/05/95	Europe				
-	-	/ _	WO 95/32016	11/30/95	PCT		~		
-	FM	1	JP 8013610 A	04/23/00	Japan			Vot Go	سررا
1	VIU	1	AU-A-34471/95	02/22/96	Australia	•		-	
9			AU 9459430	02/29/96	Australia	-			
9				04/18/96	Australia	-	HEL		1
7	M	11	AU-A-40711/95				MAY		
8	VV	VL	-EP-0-700-107-A1	05/04/06	Europe Control Political P	-, -	75	1998	-
2			GB 2 294 400 A	05/01/96	Great Britain		Ou.	-	+
	4.00		WO 96/17643	06/13/96	PCT			-	+
13	UN	14.	EP 0 747 078 A2	12/11/90	Europe			-	-
0			WO 96/39206	12/12/96	PCT	-		-	-
			WO 96/40337	12/19/96	PCT				+
127			WO 97/02064	01/23/97	PCT				-
200			WO 97/07847	03/06/97	PCT				-
10	alarakan samunia		WO 97/10019	03/20/97	PCT				-
	J. D.		WO 97/10868	03/27/97	PCT				
	V	1	WO 97/15343	05/01/97	PCT				
8	(1.4	01	EP 0 788 805 A2	08/13/97	Europe	+	-		
		1/	OTHER DOCL	JMENTS (Incl	uding Author, Title, Da	ate, Pertinent Page	es etc.)		*
0.0					2				
	NAME OF STREET								
			1			and a second		2	
		1			The second secon			0600500000000	
		//		<u>.</u>					
	EXAM	INER /	10/	11		DATE CONSI	DERES _	2	
		Mando	in Wil	mide	uson	8/2	7199	≤	
	EXAM	MNER: Initial if	citation considered, w	hether or not cit	ation is in conformance win	th MPEP 609; Draw li	ne/through cita	tion if not i	n
	confo	ano una no		.,		To the second			
	confo					No.			
		D-0838140 01				7			235
0		R:0838149.01	10 AND 12			Y	28		
		R:0838149.01			*	`\	at .	6	100

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263018312US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit: 3312

400 3 6 1500

CERTIFICATE OF MAILING BY EXPRESS MAIL

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed

First Supplemental Information Disclosure Statement,
 Form PTO-1449,

References, and

4. Return Card,

and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail", Mailing Label No.EM263018312US, with the U.S. Postal Service, addressed to Assistant Commissioner for Patents, Washington, D.C., 20231, on July 27,1998.

July 27,1998

vallrie

Mailer

July 3,1998

Andrew D. Sorensen, Reg. No. 33,606 for HOLLAND & HART LLP Post Office Box 8749 555 Seventeenth Street, Suite 3200

Denver, Colorado 80201-8749 Telephone: (303) 295-8194 Facsimile: (303) 295-8261

DENVER:0853453.01

84

A Ruse

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM263018312US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit: 3312

FIRST SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. § 1.97 the Examiner may wish to consider the references listed on the attached PTO Form-1449. In submitting the references for the Examiner's consideration, no representation is made or implied that the references are or are not material to examination of the application. The Examiner is encouraged to make his or her own determination of materiality. Copies of the references are provided.

This First Supplemental Information Disclosure Statement is being filed pursuant to 37 C.F.R. § 1.97 (b), before issuance of a first office action in the case. Thus no petition is fee is believed required. However, any fees associated with the communication may be made to Deposit Account No. 08-2326.

Respectfully submitted,

July >- \,1998

Andrew D. Sorensen, Reg. No. 33,606 for HOLLAND & HART LLP Post Office Box 8749 555 Seventeenth Street, Suite 3200 Denver, Colorado 80201-8749 Telephone: (303) 295-8194 Facsimile: (303) 295-8261

(Modified)	U.S. DEPARTMENT PATENT AND TRA			ATTY. DOCKET		SERIAL NO.	08/951,35	7	
	RMATION DISCLOS			APPLICANT Shane Douglas	HOLLIS				
(Use se	everal sheets if nece	essary)		FILING DATE October 16, 19	97	GROUP 3812	- e		
18.0		U	.S. PAT	ENT DOCUMEN	ITS				
EXAMINER	PATENT	ISSUE						FILING DAT	
INITIAL	NUMBER	DATE		PATENTEE	CLASS	SUBCLASS	APPRO	PRIA	
w.H.	4,249,527	02/10/81	Ko et	al.	T-				
1	4,870,963	10/03/89	Carter			-			
1	5,617,846	04/08/97	Graetz	et al.		1. —			
	5,645,053	0,7/08/97	Remm	ers et al.		1			
	5,682,878	11/04/97	Ogden		T	—			
1/	5,704,345	01/06/98	Bertho	on-Jones		T-			
w-14	5,715,812	02/10/98	Delgh	an et al.	—				
	NUMBER	DAT		COUNTRY	CLASS	SUBCLASS	YES	N	
co A.	DE 4432219 61-	-04/11/06		Sormany	<u> </u>		_	_	
MA	EP 0549299 A2	00/30/93		European ———			1	_	
404	EP 0705615 A1	09/08/94		uropean			<u> </u>	_	
	WO 97/28838	08/14/97	F	ст				L	
Well	WO 97/41812	11/13/97	F	CT				L	
	OTHER DOCUM	ENTS (Inc	iuding	Author, Title, C	ate, Pertine	nt Pages etc.)			
1								_	
XAMINER /	elec W.C			10u	1/	NSIDERED 4	9		
	I if citation consider conformance and no								
itation if not in c	omormance and no	Considere	d. moide	ie copy of this for	III WILLI HEAL C	Jillindinication to	applical	-	





UNITED STATES DEPARTMENT OF COMMERCE Patent and Trademark Office Address: COMMISSIONER OF PATENTS AND TRADEMARKS Washington, D.C. 20231

FIRST NAMED APPLICANT ATTORNEY DOCKET NO. SERIAL NUMBER FILING DATE HOLLIS

QM41/0916

ANDREW D SORENSEN HOLLAND & HART 555 17TH STREET SUITE 3200 P 0 B0X 8749 . DENVER CO. 80201-8749

EXAMINER ANDERSUN, C ART UNIT PAPER NUMBER 3735

DATE MAILED:

09/16/98

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

1 - PATENT APPLICATION FILE COPY

·	
Office Action Summary	Application No. Applicant(s) 08951359 SHANE D. HOILS Examiner Group Art Unit CHARLES AND ENSON 3735
-The MAILING DATE of this communication app	pears on the cover sheet beneath the correspondence address-
Period for Response	2
A SHORTENED STATUTORY PERIOD FOR RESPONSE I MAILING DATE OF THIS COMMUNICATION.	S SET TO EXPIRE MONTH(S) FROM THE
from the mailing date of this communication. If the period for response specified above is less than thirty (30) d If NO period for response is specified above, such period shall, by	FR 1.136(a). In no event, however, may a response be timely filed after SIX (6) MONTHS ays, a response within the statutory minimum of thirty (30) days will be considered timely, default, expire SIX (6) MONTHS from the mailling date of this communication. will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
Status	11/00
☐ Responsive to communication(s) filed on / Ô /	16/91
☐ This action is FINAL.	E ≈
Since this application is in condition for allowance exc accordance with the practice under Ex parte Quayle,	ept for formal matters, prosecution as to the merits is closed in 1935 C.D. 1 1; 453 O.G. 213.
Disposition of Claims	
Claim(s)	is/are pending in the application.
Of the above claim(s)	is/are withdrawn from consideration.
□ Claim(s)	is/are allowed.
& Claim(s) 1, 2, 3, 6, 18, and	is/are rejected.
(Claim(s) 2/, 5, and 16	is/are objected to.
□ Claim(s)	are subject to restriction or election
pplication Papers	requirement.
See the attached Notice of Draftsperson's Patent Draft	wing Review, PTO-948.
☐ The proposed drawing correction, filed on	is □ approved □ disapproved.
☐ The drawing(s) filed on is/are ob	ejected to by the Examiner.
☐ The specification is objected to by the Examiner.	
☐ The oath or declaration is objected to by the Examine	r.
riority under 35 U.S.C. § 119 (a)-(d)	9
 □ Acknowledgment is made of a claim for foreign priority □ All □ Some* □ None of the CERTIFIED copies 	
☐ received.	
□ received in Application No. (Series Code/Serial Nu	(2) **(*********************************
received in this national stage application from the	International Bureau (PCT Rule 1 7.2(a)).
*Certified copies not received:	· · · · · · · · · · · · · · · · · · ·
ttachment(s)	10
Information Disclosure Statement(s), PTO-1449, Paper	
□ Notice of References Cited, PTO-892	☐ Notice of Informal Patent Application, PTO-152
☑Notice of Draftsperson's Patent Drawing Review, PTO	0-948

Application/Control Number 08/951,357

Page 2

Art Unit 3735

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 6, 7, 8, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Zdzojkowski et al (5,685,296).

As to claim 1, Zvojkowski et al (296) teaches a vent value apparatus (12), which includes a washout vent (60), a vent value (42) adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent value control means (52) adapted to progressively cause said vent value to restrict the flow area of the gas washout vent in response to increase in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO2 gas through the washout vent over a range of gas supply pressure.

See figure 1, 2, 4 and 5, and columns 3-7 of Zdvojkowski et al (296) as to claims 2-3 Zdvojkowski et al teaches such. See column 3, lines 20-59 of (296).

As to claim 6, Zdrojkowski et al (296) teaches a vent value apparatus (12) in a branch connection from a mask (18). See figures 1 and 2 and columns 2 and 3 of (296).

As to claim 7, such is provided by Zdrojkowski et al (296). See figure 1 items 12, 16 and 18 and columns 2 and 3 of (296).

As to claim 8, Zdrojkowski et al (5,685,296) teaches a pressure sensitive vent value control means (52) which includes an elastic diaphragm (42) connected to the vent value such that displacement of the diaphragm results in displacement of the vent value. See Figures 2, 4,

Application/Control Number 08/951,357

Page 3

Art Unit 3735

and 5, items 42, and 52, and column 4-6 of (296).

As to claim 9, Zdvojkowski et al (296).

As to claim 20, such is taught by Zjvokowdki et al (296) teaches an elastic or rubber diaphragm (42) stretched over an Orifice (80). See figure 5, column 8, lines 16-25 of (296)

As to claim 20, such is taught by Zdrojkowski et al. See figure 1, items 62, 52, and 42, and column 4-6 of (296).

Claims 2 adm 3 objected to under 37 CAR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. (2) Claims 2 and 3 are functional and as such added no structure to the invention as claimed.

Claims 4, 5, 10-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication should be directed to Charles W. Anderson

at telephone number (703) 305-3473.

harles W. Anderson how

September 1, 1998

Mock

John G. Weiss Supervisory Patent Examiner Group 3700

TO SEPARATE, H." J TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

REV.			2					TMENT OF			SERIAL OS		557		73 ·		ATTAC	HMEN FO PER MBER	Т	
	٨	ют	ICE	OF	REF	ER	ENC	ES CITED			APPLIC	ANT(S)	57 = 0,	L/	^.· /	/~		MOER		
_	0.		_							J.S. PAT				17	02.	21	>			1
Γ	Γ		ocu	JMEN	N T N	0.		DATE	T	J.3. FAT	NAME			7	LASS	SI	JB- ASS	FILING DATE IF		
A	5	C	10	5	2	9	<	11/11/9	, h.	ライン	iva	1,16	· int	:01	7 9	-				
В	T	Ť	Ť			_	-	11/1/7	1	2412	100	2007	- 1010	~ ug		100			10.	
С	T	Ť	T						十				-	T						
D	T	T						*	1	VALUE OF THE OWNER		-		\dagger						
E	Γ	T			T				1											
F	Γ	T	T						\top					1						
G	Γ	T	T						\top											
н	T	T			П				\top					\top					MAUS	
1		T			П										-015 140 0					
J		T	T		П						17.5 3.5						E-E-AAC III			
к	Г	T	T						\top						0.50					
			-		A-				FOF	REIGN P	ATENT I	OCUME	NTS			·				
		c	ocu	MEN	NT N	о.		DATE		cou	NTRY		NAME		cı	ASS	SUB- CLAS			SPEC
L		T							T											
м			T						T					100	T			Ť		
N	Γ	Γ							T							10				
0						50.100				*			85		T					
P										5-1-16					1			\top		
Q	Γ	T							T											
				C	ТН	EF	RE	FERENC	ES (II	ncluding	Autho	r, Title,	Date, Pe	ertine	nt Pa	ges, E	tc.)		II.	
R										•		723.15								
"																	- V		Alfa	
s	L												1904							
			120																	
т	L										9									
	L																			
υ	L															10.55				
ykny	NE	R				45-1-10		To	ATE											
1/			10).(2	. 6	2	عي وجره	7	= 10										
cu	28	4	در	1		A	copy	of this re	feren											
						(5	See I	Manual of	Paten	t Exam	ining Pr	ocedure	, section	707.	05 (a).)				

NOTICE OF DRAFTPERSON'S PATENT DRAWING REVIEW

ngs whe necessary. Corrected drawings must be submitted according to	the histochous on the back of this notice.
RAWINGS: 37 CFR 1.84(a): Acceptable categories of drawings: aack ink. Color.	SECTIONAL VIEWS. 37 CFR 1.84(h)(3) Hatching not indicated for sectional portions of an object.
Color drawing are not acceptable until petition is granted.	Fig.(s)
Fig.(s)	Sectional designation should be noted with Arabic or
Pencil and non black ink is not permitted. Fig(s)	Roman numbers. Fig.(s)
HOTOGRAPHS. 37 CFR 1.84(b)	8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)
Photographs are not acceptable until petition is granted,	- Words do not appear on a horizontal, left-to-right fashion when
3 full-tone sets are required. Fig(s)	page is either upright or turned, so that the top becomes the right
Photographs not properly mounted (must brystol board or	side, except for graphs. Fig.(s)
photographic double-weight paper). Fig(s)	Views not on the same plane on drawing sheet. Fig.(s)
Poor quality (half-tone). Fig(s)	9. SCALE. 37 CFR 1.84(k)
YPE OF PAPER. 37 CFR 1.84(e)	Scale not large enough to show mechansim with crowding
Paper not flexible, strong, white and durable.	when drawing is reduced in size to two-thirds in reproduction.
Fig.(s)	Fig.(s)
folds, copy machine marks not acceptable. (tee thin)	10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(1)
Mylar, vellum paper is not acceptable (too thin).	Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality).
Fig(s)	Fig.(s)
IZE OF PAPER. 37 CFR 1.84(F): Acceptable sizes:	11. SHADING. 37 CFR 1.84(m)
21.0 cm by 29.7 cm (DIN size A4)	ALTERNATION AND ALTERNATION OF THE PROPERTY AND ALTERNATION AN
21.6 cm by 27.9 cm (8 1/2 x 11 inches)	Solid black areas pale. Fig.(s)
All drawings sheets not the same size.	Solid black shading not permitted. Fig.(s)
Sheet(s)	Shade lines, pale, rough and blurred. Fig.(s)
ARGINS. 37 CFR 18.4(g): Acceptable margins:	 NUMBERS, LETTERS, & REFERENCE CHARACTERS. 7 CFR 1.48(p)
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm	Numbers and reference characters not plain and legible.
SIZE: A4 Size	Fig.(s)
Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm	Figure legends are poor. Fig.(s)
SIZE: 8 1/2 x 11	Numbers and reference characters not oriented in the same
Margins not acceptable. Fig(s)	direction as the view. 37 CFR 1.84(p)(3) Fig.(s)
Top (T) Left (L)	Engligh alphabet not used. 37 CFR 1.84(p)(3) Fig.(s)
Right (R) Bottom (B)	Numbers, letters and reference characters must be at least
VIEWS. CFR 1.84(h)	.32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig.(s)
REMINDER: Specification may require revision to	13. LEAD LINES. 37 CFR 1.84(q)
correspond to drawing changes.	55 (4.4 × 4.
Views connected by projection lines or lead lines.	Lead lines cross each other. Fig.(s)
Fig.(s)	Lead lines missing. Fig.(s)
Partial views, 37 CFR 1.84(h)(2) Brackets needed to show figure as one entity.	
	Sheets not numbered consecutively, and in Ababic numerals
Fig.(s) Views not labeled separately or properly.	beginning with number 1. Fig.(s)
	15. NUMBERING OF VIEWS. 37 CFR 1.84(u)
Fig.(s)Enlarged view not labeled separately or properly.	Views not numbered consecutively, and in Abrabic numerals,
	beginning with number 1. Fig.(s)
Fig.(s)	16. CORRECTIONS. 37 CFR 1.84(w)
₩	Corrections not made from PTO-948 dated
	17. DESIGN DRAWINGS, 37 CFR 1.152
	Surface shading shown not appropriate. Fig.(s)
	Solid black shading not used for color contrast.
	Fig.(s)
OMMENTS	
, ,	8 2
TOWER DATE	E 425/98 TELEPHONE NO







IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit: 3312

CERTIFICATE OF MAILING BY EXPRESS MAIL

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed

- Second Supplemental Information Disclosure Statement,
 Form PTO-1449,
- Check in the Amount of \$240.00
- References, and
- 5. Return Card,

and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail", Mailing Label No.EM532669210US, with the U.S. Postal Service, addressed to Assistant Commissioner for Patents, Washington, D.C., 20231, on November 25, 1998.

November 25, 1998

Mailer

November 25

Lee R. Osman, Reg. No. 38,260

Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200 P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261

DENVER:0880436.01





Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532669210US

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit: 3312

SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STA

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. § 1.97 the Examiner may wish to consider the references listed on the attached PTO Form-1449. In submitting the references for the Examiner's consideration, no representation is made or implied that the references are or are not material to examination of the application. The Examiner is encouraged to make his or her own , determination of materiality. Copies of the references are provided.

This Second Supplemental Information Disclosure Statement is being filed pursuant to C.F.R. § 1.97 (c), after issuance of a first office action in the case. A check in the amount of \$240.00 is enclosed representing the required petition fee. Any further fees associated with this communication may be charged to Deposit Account 08-2623.

Respectfully submitted,

November_

240,00 02

11/30/1996 SSANDARA 000C0005 08951357 91 50,126

Lée R. Osman, Reg. No. 38,260

Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261





1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT

ATTY. DOCKET NO. 38730.830026.000

Sheet 1 of 5

(Use several sheets if necessary)

APPLICANT Shane Douglas HOLLIS

SERIAL NO. 08/951,357

FILING DATE October 16, 1997

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
wit.	1,926,027	09/12/33	Biggs			
	2,248,477	07/08/41	Lombard			
	2,317,608	04/27/43	Heldbrink			
	2,371,965	03/20/45	Lehmberg			
	2,438,058	03/16/48	Kincheloe			
	3,013,556	12/19/61	Galleher			
	3,189,027	06/15/65	Bartlett		_	
	3,238,943	03/08/66	Holley			
	3,362,420	01/09/68	Blackburn, et al.			
	3,363,833	01/16/68	Laerdal	-		
	3,556,122	01/19/71	Laerdal	2		1000
	3,580,051	05/25/71	Blevins	7		1.0
	3,700,000	10/24/72	Hesse, deceased et al.			
	3,783,893	01/08/74	Davison		_	
	3,796,216	03/12/74	Schwarz			
	3,903,875	09/09/75	Hughes			
	3,932,054	01/13/76	McKelvey	-		
	3,985,467	10/12/76	Lefferson .	_	_	M. 10 HW - 32 198
	3,992,598	11/16/76	Welsh et al.	-		
	4,077,404	03/07/78	Elam			= 11 - 22
	4,226,234	10/07/80	Gunderson			
	4,245,632	01/20/81	Houston	_	~	**************************************
	4,301,833	11/24/81	Donald, III			
	4,304,229	12/08/81	Curtin			
	4,347,205	08/31/82	Stewart			
149	4,387,722	06/14/83	Kearns	-		Total Control of the
	4,412,537	11/01/83	Tiger		_	
	4,448,058	05/15/84	Jaffe et al.			
	4,467,799	08/28/84	Steinberg	_		
	4,522,639	06/11/85	Ansite, et al.			
	4,530,334	07/23/85	Pagdin			
.w.A.	4,616,647	10/14/86	McCreadle		_	





Sheet 2 of

U.S. PATENT DOCUMENTS (CONTINUED)

EXAMINER	-1	TENT	ISSUE	• 1			FILING DATE
INITIAL	NUI	MBER	DATE	PATENTEE	CLASS	SUBCLASS	APPROPRIATE
·w-A	4,622,	964	11/18/86	Flynn			
1	4,671,	271	06/09/87	Bishop, et al.	~	<u> </u>	
	4,774,	941	10/04/88	Cook	-	-	
	4,795,	314	01/03/89	Prybella et al.	_	—	
	4,809,	692	03/07/89	Nowacki et al.		_	COCOCACES NAME
	4,821,	713	04/18/89	Bauman		_	
	4,827,	922	05/09/89	Champain et al.			
	4,838,	,258	06/13/89	Dryden et al.		-	
	4,841,	,953	06/27/89	Dodrill		-	
	4,848,	366	07/18/89	Aita, et al.	1		
	4,910,	,806	03/27/90	Baker et al.			www.
	4,919,	128	04/24/90	Kopala, et al.			
	4,957	107	09/18/90	Sipin		_	
	5,005		04/09/91	Loescher, et al.	I	<u> </u>	
	5,042	473	08/27/91	Lewis			
	5,042	,478	08/27/91	Kopala, et al.		-	
	5,046	,200	09/10/91	Feder			
	5,069	,205	12/03/91	Urso		-	
	5,105	,354	04/14/92	Nishimura			
	5,109	,840	05/05/92	Daleiden	_		
	5,121	,745	06/16/92	Israel	·	-	
	5,133	,347	07/28/92	Huennebeck	T .		
	5,134	,995	08/04/92	Gruenke et al.	-		,
	5,140	,982	08/25/92	Bauman			
	5,183	,983	02/02/93	Knop			
	Des.	334,633	04/06/93	Rudolph			
	5,265	,595	11/30/93	Rudolph			
	5,279	,289	01/18/94	Kirk			
1	5,305	,787	04/26/94	Thygesen			
	5,357	,951	10/25/94	Ratner			
	5,419	,318	05/30/95	Tayebi		-	
	5,429	,126	07/04/95	Bracken			
	5,431	,158	07/11/95	Tirotta			
	5,488	,948	02/06/96	Dubrullle, et al.	_	<u> </u>	
	5,540	,220	07/30/96	Gropper			
	5,542		08/06/96	Lomas	-	-	
w.A	5,570		11/05/96	Johnson			





Sheet 3 of 5

U.S. PATENT DOCUMENTS (CONTINUED)

EXAMINER INITIAL	PATENT NUMBER	ISSUE	- PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
1.w.A.	5,666,946	09/16/97	Langenback			
	5,687,715	11/18/97	Landis, et al.	—		
	5,715,814	02/10/98	Ebers	T		
1	5,740,795	04/21/98	Brydon			
.w.A	5,746,201	05/05/98	Kidd			OT THE STATE OF TH

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT NUMBER	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRANS	SLATION
						YES	NO
WAA	DE-459,104	04/26/28	Germany				
1	1,432,571	04/22/76	Great Britain		-		
	GB 1 444 053	07/28/76	Great Britain				
	GB 1 467 828	03/23/77	Great Britain	-			-
IN	JP 54 104369	08/16/79	Japan			Not Co.	udu
	WO 80/01044	05/29/80	PCT	-			
WIN	DD 159396	06/04/81	Germany				
WAA	EP 0 065 154 A1	10/27/01	European	-			
VX	DE 3015279 A1	10/29/81	Germany			-	
MIN	DE 3015279 A1	10/29/81	Germany	7	_	+	
	GB 2 077 444 A	12/16/81	Great Britain				
	WO 82/03326	10/14/82	PCT		-		9
NUL	EP 0-088 451 A1	12/00/82	European				
MIV	B1 0 088 701	09/21/03	European				
Min	EP 0 164 500 A2	03/09/85	European				
	GB 2145335 A	03/27/85	Great Britain				
	GB 2 164 569A	03/26/86	Great Britain		4		
own	FR-2-574-657-A1	06/20/06	France			-	
7	WO 86/06969	12/04/86	PCT				
0/1/1	DE 3537507 A1	04/23/07	Germany		-	20 18	
an	JP 62-103297	04/28/87	Japan		- Not C	cerido	sol le
oun	- DE 3539073 A1	-05/14/87	Germany				
WM	JP 63-275352	11/14/88	Japan		No	Consid	erad
w.A	GB 2 205 167 A	11/30/88	Great Britain	-	~		





Sheet 4 of 5

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION (Continued)

MAN -	EP 298 367 A2 EP 0 388 605 A1 WO 91/03277 EP0427474 A2	01/11/89	European	_		YES	NO
MA	EP 0 388 805 Å1 WO 91/03277	-02/20/90-	European				
	WO 91/03277		1	1			
			European		-		-
	EP0427474 A2	03/21/91	PCT	—	-		
		05/45/94	European	-	-		
11/1/1 -	FR 2 058 725 A1	08/30/91	France			0.2000.000.000	
11/1/1 -	AU 91/77110 B	11/21/91	Australia				
// / / / / / / / / / / / / / / / / / / /	JP 4-70516 A	03/05/92	Japan		Not Con	side	ed
4//4	EP 481 459 A1	04/22/92	European				
	SE 467041 B	05/18/92	Sweden				
	WO 92/15353	09/17/92	PCT				
	GB 2 254 700 A	10/14/92	Great Britain				
MAA	FR 2682042 A1	04/09/93	France			-	
/////	EP 0 602 424	11/25/93	European		-		
701	WO 94/02190	02/03/94	PCT	—			1
M	EP 608 687 A2	07/20/94	European				
70	AU-A-52628/93	07/21/94	Australia			1 - 11100	
MM	-EP 0-608-684-A1	08/03/94	European	-		P01142012000F-0-0	100.111-1550
4	WO 94/16759	08/04/94	PCT				
	WO 94/20051	09/15/94	РСТ	-	~		
	AU 94/64816 B	12/22/94	Australla	-	-		
MAN	DE 4343205 A1	06/22/95	Germany				
71/1/	EP 0 697 225	07/13/95	European				
	AU 95/16178 B	07/13/95	Australia		-	70 E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
1/1/1 -	JP 07280609-A	10/27/95	Japan		Wot Com	ides	P
9,	AU A 32914/95	02/15/96	Australia		1-		
MI	-EP 178 925 A2	04/23/90	European			-	
-401	AU B 34354/95	05/09/96	Australia				
n	WO 96/16688	06/06/96	PCT	-	-		
	AU A 39130/95	06/13/96	Australia	1-			
4.	WO 96/25983	08/29/96	PCT	-			8
UN -	JP 09/216240 A	08/19/97	Japan		Not Cous	rderes	R
9-11	WO 97/41911	11/13/97	PCT	-	-		
11/1/	-FR 2 749 176	12/05/97	France	-	 , -	A con march	
11111	DE 197 95 959	01/29/98	Germany	+==			
/1////	EP 0 821 978	02/04/90	European		-		
w.A	AU A 42027/97	02/05/98	Australia				1



08/06/98

WO 98/33433

(V.W.



Sheet 5 of 5

FOREIGN PATENT R PUBLISHED FOREIGN PATENT APPLICATION (Continued) PUBLISHED DATE TRANSLATION DOCUMENT NUMBER COUNTRY CLASS SUBCLASS YES NO 02/05/98 WO 98/04310 PCT 02/19/98 WO 98/06449 PCT WO 98/11930 03/26/98 PCT 04/30/98 Australia AU A 41018/97 WO 98/18514 05/07/98 PCT WO 98/24499 06/11/98 PCT WO 98/25662 06/18/98 PCT PCT WO 98/26829 06/25/98 PCT WO 98/26830 06/25/98 'DE 297 23 101 07/09/90 Germany

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages etc.)

PCT

west.	Mask 1 Photographs, Respironics Inc., Reusable Full Mask (small) Part # 452033 Lot #951108.									
	Mask 2 Photographs, Puritan - Bennett, Adam Curcuit , Shell Part # 231700, Swivel Part # 616329-00, Pillows (medium) Part #616324.									
	Mask 3, Photographs, DeVilbiss Healthcare Inc., DeVilbiss Seal-Ring and CPAP Mask Kit (medium), Part 73510-669.									
	Mask 4 Photographs, Respironics Inc., Monarch Mini Mask with Pressure Port. Part # 572004, Monarch Headgear, Part # 572011.									
	Mask 5 Photographs, Healthdyne Technologies, Nasai CPAP Mask (medium narrow), Part # 702510.									
	Mask 6 Photographs, Healthdyne Technologies, Soft Series Nasal CPAP Mask, Part # 702020.									
	Mask 7 Photographs, DeViibiss Healthcare Inc., Small Mask and Seal Rings, Part # 73510-668.									
	Mask 8 Photographs, Respironics Inc., Reusable Contour Mask (medium), Part # 302180.									
	Mask 9 Photographs, Healthdyne Technologies, Healthdyne Large Headgear.									
	Mask 10 Photographs, Respironics Inc., Soft Cap (medium), Part # 302142.									
	Mask 11 Photographs, Weinmann: Hamburg, Nasalmaskensystem mit Schalldämpfer (medium), Part # WN 23105									
	Mask 12 Photographs, Life Care.									
	Mask 13 Photographs, Healthdyne Technologies.									
	Mask 14 Photograph, King System.									
	Mask 15 Photographs, Respironics Inc., Paedlatric Mask.									
T	Mask 16 Photographs, Hans Rudolph Inc., Hans Rudolph Silicone Rubber Face Mask/8900.									
	Derwent: Flowmeter for fluids-has turbine transducer and volumetric sensor for simultaneous calibration									
1	Mark Kantrowitz, Erik Horskotte and Cliff Joslyn; "Answers to Frequently Asked Questions about Fuzzy Logic and Fuzzy Expert Systems" Version 1.24 last Modified 20 2 96									
XAMIN										



PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532668917US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICEIVED

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

FEB 0 3 1999

Examiner:

TECHNOLOGY CENTER 3700

Art Unit: 3312

CERTIFICATE OF MAILING BY EXPRESS MAIL

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed

- Third Supplemental Information Disclosure Statement,
 Form PTO-1449,
- Check in the Amount of \$240.00
- References, and
- 5. Return Card,

and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail", Mailing Label No.EM532668917US, with the U.S. Postal Service, addressed to Assistant Commissioner for Patents, Washington, D.C., 20231, on January 25,1999.

January 25, 1999

January 25, 1999

Lee R. Osman, Reg. No. 38,260

Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200 P.O. Box 8749

Denver, Colorado 80201-8749

Telephone: (303) 295-8589 Facsimile: (303) 295-8261

DENVER:0887795.01



RECEIVED BE

EB 03 1999 2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

Art Unit: 3312

THIRD SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. § 1.97 the Examiner may wish to consider the references listed on the attached PTO Form-1449. In submitting the references for the Examiner's consideration, no representation is made or implied that the references are or are not material to examination of the application. The Examiner is encouraged to make his or her own determination of materiality. Copies of the references are provided.

This Third Supplemental Information Disclosure Statement is being filed pursuant to C.F.R. § 1.97 (c), after issuance of a first office action in the case. A check in the amount of \$240.00 is enclosed representing the required petition fee. Any further fees associated with this communication may be charged to Deposit Account 08-2623.

January <u>25</u>,1999

02/01/1999 RTSEGAYE 00000155 08951357

01 FC:126

240.00 OP

Respectfully submitted,

Lee R. Osman, Reg. No. 38.260

Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261

i doominio.

101



RECEIVED

FEB 0 3 1999

FORM PTO-1449 U.S DEPARTMENT OF COMMERCE (Modified) PA' ENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use several sheets if necessary)

	TECHNOLOGY CONTENTS OF US				
ATTY. DOCKET NO. 38730.830026.000	SERIAL NO. 08/951,357				
APPLICANT Shane Douglas HOLLIS					
FILING DATE October 16, 1997	GROUP 3312				

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
Caux	4,499,914	02/19/85	Schebler	_		2 220000121
EWA	4,870,960	10/03/89	Hradek			
in A	6,293,864	03/15/94	McFadden	T		
, WA	5,701,883	12/30/97	Hete et al.	-		(A. C 14 - 14 - 14 - 14 - 14 - 14 - 14 - 1
C,WA	5,730,121	03/24/98	Hawkins			

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT. NUMBER	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
CWA	1,395,391	05/29/75	Great Britain			1100	
CWA	1039144	09/26/78	Canadian	_	_		
CNA	** WO 87/01950	04/09/87	PCT	_	~		
CIW.A	EP 0 236 850 A2	09/16/87	European		~		
CIWA	FR 2 672 221 A1	08/07/92	France		-		
CWA	GB 2 267 648 A	12/15/93	Great Britain				
'C.W.A	EP 0 839 545 A1	05/06/98	European	_			

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages etc.)

WA	Newl Breas PV 100 CPAP First Class Quality and Function. At the right Price; 07/04/98, pp 1-2
UA	PV 101 Bi Level CPAP and PV 102 Bi-Level Time; pp 1-3
7A-	Prodigy Medical Supplies Co. Ltd.; CPAP
DA	Puritan Bennett; Companion 318 Nasal CPAP System; 5/93
2.A	Nellcor Puritan Bennett; Announcing the Goodnight 314 and GoodKnight 318 Nasal CPAP Systems
4.	Puritan Bennett; Clean, Quiet, and Comfortable The Companion's 615 Nasal CPAP System; 6/88
1+	DeVilbiss Night Guard Nasal CPAP for the Treatment of Obstructive Sleep Apnea
A	Sunrise; DeVilbiss Horizon LT 8001 Nasal CPAP Therapy Small In Size, big on features; 8/97
.A	Devilbiss; Revitalizer Soft Start; The Facts Speak for Themselves, 1992



passing,

Sheet 2 of 2

"wA	Tranquility; Performance CPAP Advantage								
	Healthdyne International; Tranquility Plus								
	Respironics Inc.; Respironics' Solo CPAP System Provides Simplified OSA Therapy at an Outstanding value; 9/19/96								
	Respironics Inc.; The First Family of OSA Therapy; 1991								
	Fisher & Paykel Healthcare; HC200 Series Nasal CPAP Blower & Heated Humidifler								
	Pierre Medical; Morphee Plus appareil de traitment des apnees du sommeil manuel d'utilisation								
	Weinmann:Hamburg; Somnotron nCPAP-Great WM 2300, 11/91								
	Puritan Bennett; 515a Part of Our Blueprint for the Future; 03/90								
	Puritan Bennett; Companion 320 I/E Bi-Level Respiratory System; 4/93								
	ResMed; Sullivan VPAP II & II ST								
	ResMed; The Sullivan V Family of CPAP Systems; 1996								
	ResMed; The AutoSet Portable II; 1997								
	ResMed; Sullivan Nasal CPAP System								
	ResMed; The Sullivan IIID; 1995								
	ResMed; The Sullivan Comfort; 1996								
	DeVilbiss a Division of Sunrise Medical; Expand your Horizons With The Horizons; 1995								
	Healthdyne Technologies; Home Health Care Dealer; The Journal of Home Medical Equipment and Services/Supplier; November and December 1997								
	Healthdyne International; Tranquility Quest, The Compact CPAP for Greater patient comfort								
	AirStep; Medical Products Stand the Test of Time								
	MAP Medical Progress for Physician und Patient; The Gentle Therapy for Sleep-Related Breathing Disorder								
	Taema; Ventilation CP 90								
	DPAP; Breath, by breath								
	Lifecare; Smallest. Quietest. Smartest.								
	Lifecare; Quiet CPAP System for Maximum Compliance; 1991								
	Lifecare; Software Nasal Mask, Custom Nasal Masks; 1991								
	Nidek Medical; Silenzio								
	Weinmann; Just to Fell Well, Sensitive Sleep Apnea Therapy with Somnotron 3 and Somno-Mask System								
	Respironics Inc.; Aria CPAP System; 1993								
	Respironics Inc.; SleepEasy III A New Dawn in Patient Compliance								
	Respironics Inc.; Muliple Choice REMstar Choice Nasal CPAP System								
ا ال	MaxII nCPAP and Moritz II Bi-Level Brochure								
XAMINER									

3 x	40	:	٠	6.5			100 g	Exp Attorney	ress Mail No. Docket No.	EM532646050 38730,830026.
In re applicatio	on of: Shane Douglas HOL	LLIS	81		10	10				0_:
Serial No. 08/9	951,357			/	/ 0	L4/				fai
Filed: October	r 16, 1997			- (FER 1	, , , , , , , , , , , , , , , , , , ,			F	#
For: VENT VA	ALVE APPARATUS			- 1		1899 8	1		REC	
THE COMMIS Washington, D	SSIONER OF PATENTS A D.C. 20231	ND TRADEN	MARKS	,	PRADE	MARKORIN	49		דבט .	< > 1999 O 370 (
Sir:								(Groui	2700
Transmitted he	erewith for filing is an Ame	endment and	Petition for Two-Mo	onth Extension	n in the ab	ove-identified	application.		- 141	30700
☐ Small en	ntity status of this application	on under 37 (CFR 1,9 and 1,27 h	nas been estal	olished by	a verified stat	ement previously	submitte	ed.	
☐ A verifie	d statement to establish sr	mall entity sta	tus under 37 CFR	1.9 and 1.27 i	s enclosed	I.				25
☐ No addit	tional fee is required.									
The fee has b	een calculated as shown b	pelow:	4							
							SMALL			OTHER THA
	(Col. 1)		(Col. 2)	(Col. 3)		8.41	ENTITY			A SMALL ENTITY
	CLAIMS REMAINING		HIGHEST NO.	(00:.0)	7		ADDIT, FEE	1		ADDIT, FEE
	AFTER AMENDMENT		PREVIOUSLY PAID FOR	PRESENT		RATE	Janes IIII.	<u>OR</u>	RATE	
TOTAL	20	MINUS	25	= 0	_	x 9=	\$		x 18 =	\$ 0
INDEP.	4	MINUS	3	= 1	7	x 39 =	\$	1	x78=	\$ 78
			***			+130 =	\$	1	+260 =	\$ 0
FIRST	T PRESENTATION OF MU	ULTIPLE DEI	P. CLAIM			TOTAL	\$		TOTAL ADDIT. FEE	\$ 78
** If	the entry in Col. 1 is less the "Highest Number Previte" "Highest Number Previte" "Highest Number Previte" number of claims original e charge my Deposit According to the charge my Deposit Acc	viously Paid F viously Paid F ously Paid F eally filed.	for" IN THIS SPAC for" IN THIS SPAC for" (Total or Indepe	E is less than E is less than ndent) is the i	3, write "3 nighest nui	* in this space mber found fr	on the equivalent	luplicate	of this sheet	is attached.
A chec	ck in the amount of\$	100,100			io tito ino	titii extelision	tee and lee for or	ne additi		
☐ The C	ck in the amount of\$: Commissioner is hereby au unt No. 08-2623. A duplica	thorized to cl	narge payment of the	he following fe		37.8.57				
☐ The C	commissioner is hereby au	thorized to cl ate copy of th	harge payment of this sheet is attached	he following fe I.	es associa	ated with this				
☐ The C Accou	Commissioner is hereby au unt No. 08-2623. A duplica Any deficiency in filing	thorized to cl ate copy of th fees under 3	harge payment of this sheet is attached	he following fe I. presentation	es associa	ated with this				
The C Accou	commissioner is hereby au unt No. 08-2623. A duplice Any deficiency in filing to Any deficiency in paten NI 0000009 08951357	thorized to cl ate copy of the fees under 3 at application 7	harge payment of this sheet is attached	he following fe I. presentation	es associa	ated with this	communication or	credit a	ny overpaym	
☐ The C Accou	commissioner is hereby au unt No. 08-2623. A duplice Any deficiency in filing to Any deficiency in paten NI 0000009 08951357	thorized to cl ate copy of th fees under 3	harge payment of this sheet is attached	presentation of the state of th	es associa of extra cla .17. ee R. Osm OLLAND & 55 Sevente ost Office l	an & HART LLP senth Street, Box 8749 orado 80201	Dames	credit a	ny overpaym	
The C Accou	commissioner is hereby au unt No. 08-2623. A duplice Any deficiency in filing to Any deficiency in paten NI 0000009 08951357	thorized to cl ate copy of the fees under 3 at application 7	harge payment of this sheet is attached	presentation of the state of th	es associa of extra cla .17. es R. Osm OLLAND 16 ost Office enver, Col	an & HART LLP senth Street, Box 8749 orado 80201	Dames	credit a	ny overpaym	
The C Accou	Commissioner is hereby au unt No. 08-2623. A duplice Any deficiency in filing i Any deficiency in paten NI 0000009 08951357	thorized to cl ate copy of the fees under 3 at application 7	harge payment of this sheet is attached	presentation of the state of th	es associa of extra cla .17. es R. Osm OLLAND 16 ost Office enver, Col	an & HART LLP senth Street, Box 8749 orado 80201	Dames	credit a	ny overpaym	

n'il

116×102 1.174 3735 \$

PATENT

Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532646050US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

C. ANDERSON

Art Unit:

3735

RECEIVED

FEB 25 1999

CERTIFICATE OF MAILING BY EXPRESS MAIL

Group 3700

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The undersigned hereby certifies that the enclosed Amendment Transmittal Letter; Amendment, Petition for Two Month Extension of Time, Check in the Amount of \$458.00; Return Card, and this Certificate of Mailing by Express Mail relating to the above application, were deposited as "Express Mail," Mailing Label No. EM532646050US with the United States Postal Service, addressed to Assistant Commissioner of Patents, Washington, D.C. 20231, on this 16th day of February, 1999.

February 16, 1999

UA

February 6, 1999

Lee R. Osman, Reg. No. 38,260 Attorney for Applicant

HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589

Facsimile: (303) 295-8261

DENVER:0900474.01

PER 1 6 1999 SS A

UK recol 3/17/99

Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532646050US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

C. ANDERSON

Art Unit:

3735

RECEIVED

FEB 25 1999 Group 3700

Assistant Commissioner of Patents Washington, D.C. 20231

Sir:

This Amendment is filed in response to Office Action dated September 16, 1998. Filed concurrently herewith is a petition for a two month extension of time, and the appropriate fee, which extends the answer date to February 16, 1999.

AMENDMENT

In the Claims:

Please cancel claims 2, 3, 4, 9, and 10 without prejudice.

Please amend the claims as follows:

1. (Amended) A vent valve apparatus for use with a system for supplying breathable gas pressuri[s]zed above atmospheric pressure to a human or animal, the apparatus includes a gas washout vent defined by an orifice having the shape of an outwardly diverging truncated cone, a vent valve having the shape of a cone shaped plug complimentary to the shape of the washout vent, the vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply,

01

thereby substantially regulating the volumetric flow of gas and or CO_2 through the washout vent over a range of gas supply pressures.

In claim 5, line 1, replace "4" with -- 1--.

§. (Amended) [An apparatus as claimed in claim 1, wherein the pressure sensitive vent valve control means] A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus comprising:

ar

10

15

a3

a gas washout vent;

a vent valve adapted to progressively restrict the flow area of the washout vent.

a pressure sensitive vent valve control means, includ[es]ing an elastic diaphragm, produced from a rubber or other elastic diaphragm stretched over a circular orifice, connected to the vent valve such that displacement of the diaphragm results in displacement of the vent valve, adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and or CO2 through the washout vent over a range of gas supply pressures; and

means for connecting the vent valve to the rubber diaphragm to allow for the stroke of the vent valve to be adjusted.

In claim 1-1, at line 1, replace "10" with --8--.

In claim 14, at line 1, replace "10" with --8--.

16. (Amended) [An apparatus as claimed in claim 1,] A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal, the apparatus comprising:

a gas washout vent;

2

a vent valve adapted to progressively restrict the flow area of the washout vent; and

a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, said vent valve control means including [wherein the vent valve apparatus includes] an aerodynamic member disposed in the air supply conduit by a biased pivot mechanism and having an axis of rotation transverse to the direction of gas flow whereby gas passing through the conduit causes the aerodynamic member to generate lift and to be rotatably displaced in proportion to the velocity of the gas flowing through the conduit thereby substantially regulating the volumetric flow of gas and/or CO₂ through the washout vent over a range of gas supply pressures.

22. (Amended) [An apparatus as claimed in claim 1,] A vent valve apparatus for use with a system for supplying breathable gas pressuri[s]zed above atmospheric pressure to a human or animal, the apparatus comprising:

a gas washout vent;

5

a vent valve adapted to progressively restrict the flow area of the washout vent; and

a pressure sensitive vent valve control means adapted to progressively cause said vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply, said vent valve control means including [wherein the vent valve apparatus includes] an aerodynamic member suspended in a branch of the conduit and adapted for rotation about an axis transverse to the branch, thereby substantially regulating the volumetric flow of gas and/or CO₂ through the washout vent over a range of gas supply pressures.

REMARKS

This Amendment is in response to the Office Action mailed September 16, 1998. Claims 1, 5, 8, 11, 14, 16 and 22 are amended, claims 2, 3, 4, 9, 10 are

canceled, and claims 1, 5-8, and 11-25 remain in the application for further consideration. Claims 1, 5-8 and 11-25 are believed to be allowable as supported below. Such action is respectfully requested.

Claim Amendments

The Examiner stated that claims 4, 5 and 10-25 were allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The amendments set forth above satisfy the Examiner's suggested changes, as explained below.

Claim 1 has been amended to include the elements of claim 4, thereby replicating claim 4, and thus claim 1 is believed to be allowable. Claims 5, 6 and 7 depend from and further define claim 1, and thus are believed to also be allowable.

Claim 8 has been amended to include the elements of claims 1, 9 and 10, thereby replicating claim 10, and is thus believed to be allowable. Claims 11, 12, 13, 14 and 15 all depend variously from and further define claim 8, and thus are also believed to be allowable.

Claim 16 has been amended to include the elements of claim 1, from which it depended, and thus is believed to be allowable. Claims 17-21 depend variously from, and further define, claim 16, and thus are also believed to be allowable.

Claim 22 has been amended to include the elements of claim 1, from which it depended, and thus is believed to be allowable. Claims 23-25 depend variously from, and further define, claim 22, and thus are also believed to be allowable.

This application claims priority under 35 U.S.C. § 119 to Australian Provisional Patent Application PO3017 filed October 16, 1996. Applicant requests that the Examiner acknowledge receipt of the certified copy of said application which was filed on April 9, 1998.

Claims 1, 5-8, and 11-25 remain in this application for review. It is believed that the amendments made above place these claims in condition for allowance. Such action is respectfully requested.

Signed at Denver, Colorado, this 16th day of February, 1999.

Respectfully submitted,

Lee R. Osman, Reg. No. 38,260 Attorney for Applicant HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261

HH:900474 vl

#10

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532646050US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

C. ANDERSON

Art Unit:

3735

PETITION FOR TWO MONTH EXTENSION OF TIME

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Applicant, by and through the undersigned attorney, hereby petitions for a two month extension of time for responding to the Office Action of September 16, 1998, *i.e.*, up to and including February 16, 1999. A check in the amount of \$458.00 is enclosed in payment of the three-month extension fee (\$380.00) and fee for one additional independent claim (\$78.00). Any additional fees required to be paid under 37 C.F.R. 1.17 may be charged to Deposit Account No. 08-2623

Signed at Denver, Colorado, on this 16th day of February, 1999 Respectfully submitted,

02/22/1999 NHASSANI 00000009 08951357

01 FC:116

380.00

Lee R. Osman, Reg. No. 38,260

Attorney for Applicant

HOLLAND & HART LLP 555 17th Street, Suite 3200

Post Office Box 8749

Denver, Colorado 80201

Telephone: (303) 295-8589

Facsimile: (303) 295-8261

DENVER:0900474.01

Attorney Docket No.-38730.830026.000 Express Mail Label No. EM532643892US

IN THE UNITED ST TES PATENT AND TRADEMARK OFFICE

APR 2 1 1999

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

RECEIVED

APR 2 7 1999 Examiner:

Art Unit: 3312 TECHNOLOGY CENTER 3700

(TO) seli-T bewollAlserioD noisivio Brinsilau9

CERTIFICATE OF MAILING BY EXPRESS MAIL 6661 98 LYW

Assistant Commissioner for Patents Washington, D.C. 20231

BECEINED

. Sir:

The undersigned hereby certifies that the enclosed

- Fourth Supplemental Information Disclosure Statement,
 Form PTO-1449,
- Check in the Amount of \$240.00 3.
- References, and
- 5. Return Card,

and this Certificate of Mailing by Express Mail, relating to the above application, were deposited as "Express Mail", Mailing Label No.EM532643892US, with the U.S. Postal Service, addressed to Assistant Commissioner for Patents, Washington, D.C., 20231, on April 21,1999 .

April 21,1999

Mailer

Lee R. Osman, Reg. No. 38,260

Attorney for Applicant HOLLAND & HART LLP 55/5 17th Street, Suite 3200

P.O. Box 8749 Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261

DENVER:0914082.01

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EM532643892US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

RECEIVED

Art Unit: 3312 APR 2 7 1999

TECHNOLOGY CENTER 3700

FOURTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. § 1.97 the Examiner may wish to consider the references listed on the attached PTO Form-1449. In submitting the references for the Examiner's consideration, no representation is made or implied that the references are or are not material to examination of the application. The Examiner is encouraged to make his or her own determination of materiality. Copies of the references are provided.

The German reference 701 690 appears to describe a nasal mask with in-flow and exhaust passageways found in the straps.

The German reference DE 34 02 603 A1 is included with a translation of the abstract for the convenience of the Examiner.

The German reference DE 298 10 846 U1 is included with a translation of the abstract for the convenience of the Examiner.

The European reference 0 388 525 A1 is included with a translation of the abstract for the convenience of the Examiner.

The European reference 0 062 166 A2 is included with a translation of the abstract for the convenience of the Examiner.

The European reference 0 872 643 A2 is included with a translation of the abstract for the convenience of the Examiner.

04/23/1999 RMAGAT 00000040 08951357

01 FC:126

240.00 OP

This Fourth Supplemental Information Disclosure Statement is being filed pursuant to C.F.R. § 1.97 (c), after issuance of a first office action in the case. A check in the amount of \$240.00 is enclosed representing the required petition fee. Any further fees associated with this communication may be charged to Deposit Account 08-2623.

Respectfully submitted,

April 21 ,1999

M. Dona Lee R. Osman, Reg. No. 38.260
Attorney for Applicant
HOLLAND & HART LLP
555 17th Street, Suite 3200
P.O. Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8589 Facsimile: (303) 295-8261

RECEIVED

APR 2 7 1999 Sheet 1 of 4

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO. 38730.830026.000 SERNEHWOLDEN CENTERT3700

NFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use Peveral sheets if necessar veral sheets if necessary)

APPLICANT Shane Douglas HOLLIS

FILING DATE October 16, 1997 **GROUP 3312**

T& TRADENAME		NOT THE TOTAL PROPERTY.				FILING DATE
XAMINER	PATENT	ISSUE		S		FILING DATE IF
INITIAL	NUMBER	DATE	PATENTEE	CLASS	SUBCLASS	APPROPRIATE
	781,516	01/31/05	Guthrie	PARESTALLINGUE MARTINE		
233270	812,706	02/13/06	Warbasse			-
	1,081,745	12/16/13	Johnston et al.			
7	1,192,186	07/25/16	Greene			
	1,653,572	12/20/27	Jackson			
	2,317,608	09/23/43	Heldbrink			
	2,376,871	05/24/45	Fink			
	2,415,846	02/18/47	Randall			· · · · · · · · · · · · · · · · · · ·
	2,578,621	12/11/51	Yant			7/4-000
	3,013,556	12/19/61	Galleher	-		
	3,099,985	08/06/63	Wilson et al.			
	3,720,235	03/13/73	Schrock	-		
	3,741,208	06/26/73	Jonsson et al.	+		
	3,799,164	03/26/74	Rollins			
	3,914,994	10/28/75	Banner			3
	3,995,661	12/07/76	Van Fossen		-	
	4,109,749	08/29/78	Sweet			
	4,328,797	05/11/82	Rollins, III et al.			
	4,396,034	08/02/83	Cherniak			
	4,449,525	05/22/84	White et al.			
	4,558,710	12/17/85	Eichler			
	4,579,114	04/01/86	Gray et al.			
	4,616,647	10/14/86	McCreadie	-		
	4,677,975	07/07/87	Edgar et al.			
	Des. 293,613	01/05/88	Wingler	-		
	4,739,755	04/26/88	White et al.			
	4,739,755	04/26/88	White et al.			



Sheet 2 of 4

U.S. PATENT DOCUMENTS

EXAMINER	PATENT	ISSUE	-	10		FILING DATE
INITIAL	NUMBER	DATE	PATENTEE	CLASS	SUBCLASS	APPROPRIATE
	4,773,411	09/27/88	Downs			.*
	4,799,477	01/24/89	Lewis .			
	4,819,629	04/11/89	Jonson	1 8		
	4,856,506	08/15/89	Jinotti			
	4,910,806	03/27/90	Baker et al.			
	4,938,210	07/03/90	Shene			
	4,938,212	07/03/90	Gnook et al.			
•	4,944,310	07/31/90	Sullivan	-		
	4,986,269	01/22/91	Hakkinen	+		
	5,046,200	09/10/91	Feder			
	5,063,922	11/12/91	Hakkinen			
	Des. 323,908	02/11/92	Hollister et al.			
	5,109,839	05/05/92	Blasdell et al.			
	5,159,938	11/03/92	Laughlin			
	5,174,287	12/29/92	Kallok et al.			
	5,178,138	01/12/93	Walstrom et al.			
	5,230,330	07/27/93	Price			
	5,231,983	08/03/93	Matson et al.			
	5,233,978	08/10/93	Callaway			
	5,280,784	01/25/94	Kohler			
	5,311,862	05/17/94	Blasdell et al.	-		
	5,322,057	06/21/94	Raabe et al.			
	5,372,130	12/13/94	Stern et al.	-		
	5,388,571	02/14/95	Roberts et al.			
	5,398,673	03/21/95	Lambert .			
	5,404,871	04/11/95	Goodman et al.			
	5,479,920	01/02/96	Piper et al.			
	5,509,404	04/23/96	Lloyd et al.			
	5,526,805	06/18/96	Lutz et al.			
	5,538,000	07/23/96	Rudolph	1		
	Re. 35, 339	10/01/96	Rapoport		1	



Sheet 3 of 4

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,560,354	10/01/96	Berthon-Jones et al.			
	5,567,127	10/22/96	Wentz			
	5,608,647	03/04/97	Rubsamen et al.			
	5,642,730	07/01/97	Baran	 		
	5,649,532	07/22/97	Oren			
	5,649,533	07/22/97	Griffiths			
	5,655,520	08/12/97	Howe et al.	1	İ	
•	5,657,493	08/19/97	Ferrero et al.	1		
	5,662,101	09/02/97	Ogden et al.	 		
	5,685,296	11/11/97	Zdrojkowski et al.			
2	5,794,615	08/18/98	Estes	-		
	5,813,423	09/29/98	Kirchgeorg			
	5,823,187	10/20/98	Estes et al.	 		
	5,832,918	11/10/98	Pantino		-	

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT	PUBLISHED	COUNTRY	CLASS	SUBCLASS	TRANS	LATION
				(10 m) (4 m) (4 m)		YES	NO
	701 690	01/22/41	Germany	1			
	WO 82/03548	10/28/82	Sullivan				,
+	EP 0 062 166 A2	10/13/82	European	-			
+	DE 34 02 603 A1	08/01/85	Germany	 			
 1	JP 60-212607	10/24/85	Japan				
 +	EP 0 185 980	07/02/86	European				
	EP 0 872 643 A2	03/10/88	European	1			
	JP 2-173397	12/23/88	Japan	1			
 +	EP 0 388 525 A1	09/26/90	European	 			* *//***
+	SU 1710064 A1	02/07/92	Sweden				
	EP 0 481 459 A1	04/22/92	European				1001000
	GB 2 271 811 A	04/27/94	Great Britain	-			+-
 -	AU B 79174/94	06/08/95	Australla	-	-		+



Sheet 4 of 4

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	r	DOCUMENT	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION		
							YES	NO	
		WO 98/35715	08/20/98	PCT			E		
	-	WO 98/36245	08/20/98	PCT				1	
		WO 98/36338	08/20/98	PCT		 		1	
		DE 298 10846 U1	08/20/98	Germany		<u> </u>		1	
		WO 98/47554	10/29/98	PCT				 	
		WO 98/48878	11/05/98	PCT	\			 	
		WO 98/57691	12/23/98	PCT					
<u> </u>		AU A 89312/98	01/07/99	Australian	 		-		

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages etc.)

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.





UNITED STA. DEPARTMENT OF COMMERCE Patent and Trademark Office Address: COMMISSIONER OF PATENTS AND TRADEMARKS Washington, D.C. 20231

FILING DATE

Transaction History Date 1999-04-27

Date information retrieved from USPTO Patent Application Information Retrieval (PAIR) system records at www.uspto.gov

EXAMINER ART UNIT PAPER NUMBER

3761 12

DATE MAILED:

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

NOTICE OF ALLOWABILITY
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Dug or other appropriate communication will be mailed in due course.
This Communication is responsive to amondment filed February 25,1999
The allowed claim(s) is/are 1. 5-8. 11-25
☐ The drawings filed on are acceptable.
Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
□ All □ Some* □ None of the CERTIFIED copies of the priority documents have been
received.
☐ received in Application No. (Series Code/Serial Number)
, *
received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
*Certified copies not received:
Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
A SHORTENED STATUTORY PERIOD FOR REPLY to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).
☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION; PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
Applicant MUST submit NEW FORMAL DRAWINGS
☐ because the originally filed drawings were declared by applicant to be informal.
D'including changes required by the Notice of Draftperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 6
including changes required by the proposed drawing correction filed on, which has been approved by the examiner.
☐ Including changes required by the attached Examiner's Amendment/Comment.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftperson.
☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.
Any reply to this notice should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.
Attachment(s)
□ Notice of References Cited, PTO-892
□ Notice of References Cited, PTO-892 □ Information Disclosure Statement(s), PTO-1449, Paper No(s). 6 + 1/2, Not; all fatents which were lined out on
□ Notice of Draftsperson's Patent Drawing Review, PTO-948
Notice of Informal Patent Application, PTO-152
□ Interview Summary, PTO-413. Considered by the
Examiner's Amendment/Comment
☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material ☐ Examiner's Statement of Reasons for Allowance
PTOL-37 (Rev. 8/97) John G. Welss Supervisory Patent Examiner
"U.S. GPO: 1998-433-221/82108 Supervisor y Patient Control of the



UNITED STATES DEPARTMENT OF COMMERCE Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

QM41/0427

ANDREW D SORENSEN
HOLLAND & HART
555 17TH STREET SUITE 3200
P O BOX 8749
DENVER CO 80201-8749

APPLICATION NO.	FILING DATE .	TOTAL CLAIMS	EXAMINER AND GROUP AF	RT UNIT	DATE MAILED
08/951,357	10/16/97	020 A	NDERSON, C	3761	04/27/99
First Named HOLLIS,	201 1220 1111	35 USC	154(b) term ext. =	0 Days	

TITLE OF ENT VALVE 'APPARATUS

A	TTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH	NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3	38730.83002	5 128-205	.240	S41	UTILITY	YES	\$605.00	07/27/99

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN <u>THREE MONTHS</u> FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. <u>THIS STATUTORY PERIOD CANNOT BE EXTENDED.</u>

HOW TO RESPOND TO THIS NOTICE:

- Review the SMALL ENTITY status shown above.
 If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:
- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.
- II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.
- III. All communications regarding this application must give application number and batch number.

 Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use th ~ qh 06/30/99. (0651-0033)

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EL222664550US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

VENT VALVE APPARATUS

Examiner:

C. ANDERSON

Art Unit:

Batch:

3761

S41

Allowed:

April 27, 1999

CERTIFICATE OF MAILING BY EXPRESS MAIL

Box ISSUE FEE

Assistant Commissioner for Patents

Washington, D.C. 20231

RECEIVED

THE 3 1 1999

Sir:

Publishing Division

The undersigned hereby certifies that the enclosed Part B-Issue Fee Transmittal; Information Regarding References Not Considered in Prior Information Disclosure Statements and Request for Supplemental Notice of Allowance; Form PTO-1449; Copy of Cited References; Check in the Amount of \$1,240.00; Certificate of Mailing by Express Mail; and Return Card, relating to the above application, were deposited as "Express Mail," Mail; and Return Card, relating to the above application, incompanies and Mailing Label No. EL222664550US with the United States Postal Service, addressed to Box ISSUE FEE, Assistant Commissioner for Patents, Washington, D.C., 20231, on this 26 day of July, 1999.

July 26, 1999

James A Pinto, Registration No. 40,774

HOLLAND & HART LLP 555 17th Street, Suite 3200

Post Office Box 8749 Denver, Colorado 80201-8749

Telephone: (303) 295-8254 Facsimile: (303) 295-8261

DENVER:0933280.01

			3	BEST	COPY
		d ·			<u> </u>
					in in
8 .		7-4-2	-	المحدد	, ia
				35.4.1	
			· 方人类 20 卷 1 7 编入		
	PA	HT B-ISSUE FEE THOU	EMITTAL	and the same	
Complete and man	togen. Die fees	, to: Box ISSUE FEE Assistant Commiss Washington, D.C. 2		Al	1
MAILING INSTRUCTIONS: This	form should be used for traitsmi	tting the ISSUE FEE. Blocks	1 Note: The certificate of m	alling below can only be	used for domestic
Receipt, the Patent, advance orde correspondence address as indica	ere appropriate. All further corresponders and notification of maintenance ated unless corrected below or directed by directed below or directed by di	fees will be mailed to the curre ected otherwise in Block 1, by (mailings of the Issue Fee for any other accompanying assignment or formal draw	Transmittal. This certificat g papers. Each additional	te cannot be used paper, such as an
maigtenance fee notifications.	SS (Note: Legibly mark-up with any correc		I hereby certify that this is the United States Postal S	Tcate of Mailing sue Fee Transmittal is bel	ing deposited with
ANDREW D SOF	RENSEN	QM41 243678 30	mail in an envelope addres the date indicated below.	ssed to the Box Issue Fee	address above on
HOLLAND & HO 555 17TH STE • P 0 BOX 8749	REET SUITE 3200	O Comme		35	(Depositor's name)
DENVER, CO 8		PATENT & THE		3	(Signature)
APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP	ART UNIT	DATE MAILED
08/951,357	10/16/97 02	0 ANDERSON	, C	3761 0	4/27/99
First Named HOLLIS,		35 ŲSC 15(́4 (Ь)	term ext. =	0 Days.	
INVENTION NT VALVE A	PPARATUS		2		ta 82
ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO. APPLN. TYP		605.00 0	7/27/99
3 38730.8300	A HE L	110 - 100 -	TY YES \$		11.2,11.50
Use of PTO form(s) and Custor Change of correspondence a PTO/SB/122) attached.	ress or Indication of "Fee Address", her Number are recommended; but i address (or Change of Corresponder "Fee Address" Indication form PTO/	not required (1) in a name attorneys of the name of member a and the name stand the name attorneys of the name of	es of up to 3 registered patent r egénts/DR, alternatively, (2) of a single firm (having as a registered attorney or agent) nes of up to 2 registered patent agents. If no name is listed, no	1 HOLLand &	Hart ILP
	NO. 000557	name will b	4a: The following fees are e	oclosed (make check pay	able to Commissioner
PLEASE NOTE: Unless an as- inclusion of assignee data is o the PTO or is being submitted filing an assignment.	signee is identifiéd below, no assigne nly appropiate when an assignment i under separate cover. "Completion o	e data will appear on the patent. has been previously submitted to	of Patents and Tradema	rks):	-
(A) NAME OF ASSIGNEE Resided Limited (B) RESIDENCE: (CITY & STANOTH Ryde, Ne		RALIA	4b: The following fees or de DEPOSIT ACCOUNT N (ENCLOSE AN EXTRA	UMBER 08-2623	uld be charged to:
☐ Individual Scorpora	lon or other private group entity	government	☐ Issue Fee ☐ Advance Order - # of	Coples_10	- /20/
The COMMISSIONER OF PATER (Authorized Signature)	TS AND TRADEMARKS IS request	(Date)	application identified above.		$\overline{}$
NOTE; The scue Fee will not be or agent; or the assignee or other Trademark Office.	accepted from anyone other than the party in interest as shown by the re-	7-26-99 e applicant; a registered attorney cords of the Patent and	07/28/1999 STEFER	RR1 00000039 089513	57
Burden Hour Statement: This depend on the needs of the to complete this form should to Office. Washington, D.C. 2023	oform is estimated to take 0.2 hou individual case. Any comments on sent to the Chief Information Cont. DO NOT SEND FEES OR CONTHIS FORM TO: Box Issue Fee 31	on the amount of time required Officer, Patent and Trademark OMPLETED FORMS TO THIS	01 FC:142 02 FC:561	18	19/ .
Under the Paperwork Reduction	on Act of 1995, no persons are request a valid OMB control number.	uired to respond to a collection		1	
PTOL-85B (REV.10-96) Approved	Tor use through 06/30/99. OMB 065	RANSMIT THIS FORM WIT	H FEE Patent and Trad	7	OMMER

#13

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EL222664550US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Shane Douglas HOLLIS

Serial No.: 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner: C. ANDERSON

Art Unit: 3761

Batch: S41

Allowed: April 27, 1999

INFORMATION REGARDING REFERENCES FILED AND NOT CONSIDERED IN PRIOR INFORMATION DISCLOSURE STATEMENTS and REQUEST FOR SUPPLEMENTAL NOTICE OF ALLOWANCE

Box ISSUE FEE Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

The following paper is filed in response to the Examiner's Notice of Allowance mailed April 27, 1999, indicating that prior art references timely submitted earlier were not considered. It is requested that the Examiner consider the references not previously considered, and if appropriate issue a Supplemental Notice of Allowance.

In the Notice of Allowance, the Examiner stated that "all patents which were lined out on the 1449 were not considered by the Examiner. See M.P.E.P. 609A(3)." The Examiner had lined out a total of 51 references -- 15 references listed on the 1449 Form filed May 13, 1998; 3 references listed on the 1449 Form filed on July 27, 1998; and 33 references listed on the 1449 Form filed November 25, 1998. It is believed that 41 of these references were properly submitted in English and should have been considered. Copies of these references are again provided herewith for the Examiner's convenience.

It is also noted that the Examiner has not indicated consideration of the references cited in the Information Disclosure Statements filed on January 25, 1999 and April 21, 1999. It is requested that the

Examiner also consider these references, all of which were submitted before the mailing date of the Notice of Allowability.

As to the remaining 10 references previously submitted, these references are now provided with either a translation of the abstract, or a concise explanation, under Rule 37 C.F.R. § 98(a)(3). Copies of these references are again provided herewith for the Examiner's convenience:

The German reference DE 459,104 appears to describe a mask of for covering one's mouth, or both of one's mouth and nose.

The German reference DE 3345067 A1 is included with a translation of the abstract for the convenience of the Examiner.

The European reference (in French) EP 0 171 321 A1 is included with a translation of the abstract for the convenience of the Examiner.

The French reference FR 2 574 657 A1 appears to describe a piece of material position over a users mouth.

The German reference DE 3539073 A1 is included with a translation of the abstract for the convenience of the Examiner.

The European reference (in German) EP 0 386 605 A1 is included with a translation of the abstract for the convenience of the Examiner.

The German reference DE 4004157 C1 is included with a translation of the abstract for the convenience of the Examiner.

The French reference FR 2 658 725 A1 is included with a translation of the abstract for the convenience of the Examiner.

The European reference (in German) EP 0 705 615 A1 is included with a translation of the abstract for the convenience of the Examiner.

The German reference DE 4343205 A1 C1 is included with a translation of the abstract for the convenience of the Examiner.

In again submitting the references for the Examiner's consideration, no representation is made or implied that the references

are or are not material to examination of the application. The Examiner is encouraged to make his or her own determination of materiality.

Since these references were previously cited before the Notice of Allowance, no fee is believed due. However, any fees deemed due by the Examiner associated with this communication may be charged to Deposit Account No. 08-2623.

July 26,1999

Respectfully submitted,

James A. Pinto, 40,774 HOLLAND & HART LLP 555 17th Street, Suite 3200 P.O. Box 8749

P.O. Box 8749
Denver, Colorado 80201-8749
Telephone: (303) 295-8254
Facsimile: (303) 295-8261

DENVER:0932494.01

			Sheet 1 of <u>2</u>
FORM PTO-144 COMMERCE	9 U.S. DEPARTMENT OF	ATTY. DOCKET NO. 38730.830026.000	SERIAL NO. 08/951,357
(Modified) OFFICE	PATENT AND TRADEMARK	30730.830020.000	
IN	FORMATION DISCLOSURE	APPLICANT	201
S.	FATEMENT BY APPLICANT	Shane Douglas HOLLIS	
(Use	several sheets if necessary)	FILING DATE	GROUP 3761

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

-		NUMBER	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRAN	ISLATION
			133000000000000000000000000000000000000				YES	NO
		DE 459,104	04/26/28	Germany				
pu		JP 54-104369	08/16/79	Japan 🔬	botrace	any		
		DD 159399	00104101	-Germany				
Tim		EP 0 054 184 X1	10/27/81	European	botra	towly.		500 500
10		DE 3015279 A1	10/29/81	Germany A	bstrac	of Ouly		0 15 35 35 17 18 1
w		EP 0 066 451 A1	12/08/82	European				
in		B1 0 088 761	09/21/83	European				
ne		DE 3345067 A1	06/20/84	Germany	Abstrat	tacky	27 55	
pu		EP 0 164 500 A2	03/09/85	European /	bstract	Culy		
ja		EP 0 171 321 A1	02/12/86	Europe AL	stract	onti		
		FR 2 5/4 65/ AT	06/20/86	Prance				
al		DE 3537507 A1	04/23/87	Germany A	betract	Outy		
(cu)		JP 62-103297	04/28/87	Japan A	stract (culy		02.55
		DE 3839073 A1	05/14/87	Germany			- PAULTER N	300
nu		EP 0 252 052 A1	01/07/88	Europe	_			
100		EP 0 264 772 A1	04/27/88	Europe				
w		JP 63-275352	11/14/88	Japan A	frect C	culop		
w		EP 298,367 A2	01/11/89	European				
10		EP 0 386 605 A1	02/28/90	European		et only	in .	
ew		DE 4004157 C1	04/11/91	Germany	Abstra	t only	THE STATE OF THE S	
100		EP 0 425 092 A1	05/02/91	Europe			65.0 co. a 7.4 24/mil.	
10		EP0427474 A2	05/15/91	European				
w		FR 2 658 725 A1	08/30/91	France /	bs tra	I outy	2	
nu		EP 0 462 701 A1	12/27/91	Europe				
w	1100	JP 4-70516 A	03/05/92	Japan A	6- Frac	f only		
1w		EP 481 459 A1	04/22/92	European				
new	131	FR 2682042 A1	04/09/93	France A	botrac	+ ouly		
1in		EP 0549299 A2	06/30/93	European			7-10-10-10-20-10-	
		EP 0 602 424	11/25/95	European				-
16m		EP 606 687 A2	07/20/94	European	_			
7u		EP 0 608 684 A1	08/03/94	European	~		1128-230-00-000	
		EP 0705545-A1	09/00/94	European				
101		JP 6-249742 A	09/09/94	Japan A E	stract	Only		
a		DE 35390	73 5/87	6-ca	y Ab	strat on	10	
6		EP 705615		E.P.	A1	Land Das	v	

126

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION (cont.)

ŧ	DOCUMENT NUMBER EP 0 714 670 A2 EP 0 656 216 A2 DE 4343205 A1	PUBLISHED DATE	COUNTRY	CLASS	SUBCLASS	TRAI	NSLATION
						YES	NO
	EP 0 714 670 A2	12/02/94	Europe				
w	EP 0 656 216 A2	06/07/95	Europe	~			
	DE 4343205 A1	06/22/95	Germany	Abs from	tonly		
w	EP 0 661 071 A1	07/05/95	Europe				1
in .	EP 0 697 225	07/13/95	European A	estract.	party		
	JP 07280609 A	10/27/95	Japan Ab	stract (enty		
	JP 8019610 A	01/23/96	Japan Ab	Frank O	nly		
w	DE 4432219 C1	04/11/96	Germany	-			
2	EP 178 925 A2	04/23/96	European				
w	EP 0 709 107 A1	05/01/96	Europe	-			

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

DENVER:0932494.01

3761

430 Rec'd PCT/

2) AUG 1999

AUG 2 7 1999

Attorney Docket No. 38730.830026.000 Express Mail Label No. EL222664815US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Box OFFICIAL DRAFTSMAN

Assistant Commissioner for Patents Washington, D.C. 20231

Examiner:

C. ANDERSON

Art Unit:

3761

Batch:

S41

Allowed:

April 27, 1999

CERTIFICATE OF MAILING BY EXPRESS MAIL

RECEIVED

SEP 2: 1999

TECHNOLOGY CENTER 3700

Sir:

The undersigned hereby certifies that the enclosed Submission of Formal Drawings; Three (3) Sheets of Formal Drawings; Petition for One-Month Extension; Certificate of Mailing by Express Mail; and Return Card, relating to the above application, were deposited as "Express Mail," Mailing Label No. EL222664815US with the United States Postal Service, addressed to Box OFFICIAL DRAFTSMAN, Assistant Commissioner for Patents, Washington, D.C., 20231, on this 27th day of August, 1999.

August 27, 1999

Mailer

August <u>27</u>, 1999

James A. Pinto, Registration No. 40,774

HOLLAND & HART LLP 555 17th Street, Suite 3200

Post Office Box 8749

Denver, Colorado 80201-8749 Telephone: (303) 295-8254 Facsimile: (303) 295-8261

DENVER:0939948.01

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EL222664815US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

VENT VALVE APPARATUS

Examiner: C. ANDERSON

Art Unit:

3761 .-

S41

Allowed:

Batch:

April 27, 1999

SUBMISSION OF FORMAL DRAWINGS

RECEIVED SF2 2 - 1999

Box OFFICIAL DRAFTSMAN Assistant Commissioner for Patents Washington, D.C. 20231

TECHNOLOGY CENTER 3700

Dear Sir:

Enclosed herewith please find three (3) sheets of formal drawings which are to be filed in the above-identified case in substitution for drawings previously filed. These drawings have been corrected to include the changes required by the Draftsman in the NOTICE OF DRAFTPERSON'S REVIEW dated April 25, 1998. In particular, the formal drawings submitted herewith do not have copy machine marks, and are believed to have acceptable character of lines, numbers, and letters. No new matter is introduced by the formal drawings. Accordingly, it is requested that the formal drawings be accepted for entry in the application.

A Petition for One-Month extension of Time is submitted herewith. If any additional extensions of time are required, consider this a petition therefor and charge deposit account 08-2623 the required fee. Any questions regarding these formal drawings should be directed to the undersigned. Signed at Denver, Colorado this 27th day of August, 1999.

Respectfully submitted,

James A. Pinto, Reg. No. 40,774

HOLLAND & HART LLP 555 17th Street, Suite 3200

P.O. Box 8749

Denver, CO 80201-8749

Telephone: (303) 295-8254 Facsimile: (303) 295-8261

DENVER:0939948.01

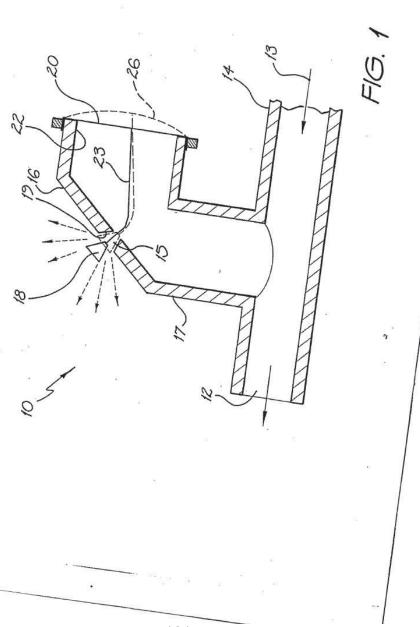


U.S. Patent Application Serial No. 08/951,357
Title: VENT VALVE APPARATUS
Filed: October 16, 1997
Inventor: Shane Douglas HOLLIS
Examiner: C. ANDERSON GAU 3761 Batch S41
Attorney: James A. Pinto
Attorney Telephone: (303) 295-8254
Attorney Docket No. 38730.830026.000

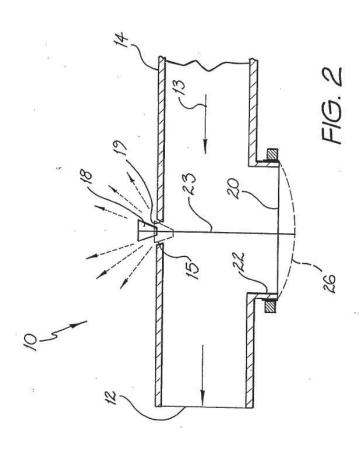
Page 1 of 3

TC 3700 HAIL ROOM RECEIVED SSP 21 1950

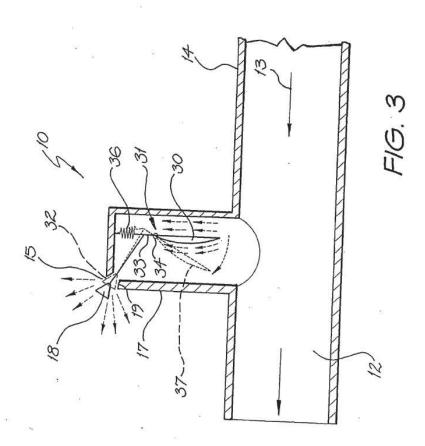




APPROVED	O.G. F	IG.
BY	CLASS	SUPCLAS
DRAFTSMAN		



APPROVED	O.G. F	FIG. ,3
BY	CLASS	SUBCLASS
DRAFTSMAN	120	205,24



AUG 2 7 1999

PATENT Attorney Docket No. 38730.830026.000 Express Mail Label No. EL222664815US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Shane Douglas HOLLIS

Serial No. 08/951,357

Filed: October 16, 1997

For: VENT VALVE APPARATUS

Examiner:

C. ANDERSON

Art Unit: Batch: 3761

S4

Allowed:

April 27, 1999

PETITION FOR ONE MONTH EXTENSION OF TIME

Box OFFICIAL DRAFTSMAN Assistant Commissioner for Patents Washington, D.C. 20231 RECEIVED

SED 2 1 1999

Sir:

TECHNOLOGY CENTER 3700

Applicant, by and through the undersigned attorney, hereby petitions for a one month extension of time for submission of formal drawings, *i.e.*, up to and including August 27, 1999. The fee of \$110.00 required to be paid under 37 C.F.R. 1.17 may be charged to Deposit Account No. 08-2623.

Signed at Denver, Colorado, on this 27th day of August, 1999.

Respectfully submitted,

James A. Pinto, Reg. No. 40,774

HOLLAND & HART LLP 555 17th Street, Suite 3200

Post Office Box 8749 Denver, Colorado 80201

Telephone: (303) 295-8254 Facsimile: (303) 295-8261

DENVER:0939948.01

Transaction History Date 1999 – 10-29
Date information retrieved from USPTO Patent
Application Information Retrieval (PAIR)
system records at www.uspto.gov



UNITED STATES DEPARTMENT OF COMMERCE Patent and Trademark Office Address: COMMISSIONER OF PATENTS AND TRADEMARKS

	l ₃	wasnington	, D.C. 20231	
SERIAL NUMBER FILING DATE	HOLLIS FIRST NAM	ED APPLICANT	S	ATTORNEY DOCKET NO.
	QM12/1029		ANDERS	ENAMINER
ANDREW D SORENSEN			THADLING	
HOLLAND & HART	2200			
555 17TH STREET SUITE	3200		CARE UNIT	PAPER NUMBER
P 0 BOX 8749 DENVER CO 80201-8749				10
DERVER CO GOZOT G.A.	*	0		10/29/96
		DA:	TE MAILED:	
1 as		DA	TE MAILED.	
Sub.	NOTICE OF ALLOWA	ARILITY AF/S	-1 3:	5-7
	HOHOL OF ALLOWA	1512111 00 / /-	.,	× ×
RT I.				
bis communication is responsive to	7-20-99			
 All the claims being allowable, PROSEC herewith (or previously mailed), a Notice course. 				
The allowed claims are	8, 11-25			
The drawings filed on P-27-			/	r
received. [_] been filed in parent application	on Serial No		ny nas (±) be	en received. [_] not been
Note the attached Examiner's Amendment				
Note the attached Examiner Interview Sun				10
Note the attached Examiner's Statement of				
Dole the attached NOTICE OF REFERENCE			¥1	
Note the attached INFORMATION DISCLO	SURE CITATION, PTO-1449.	8		
Note the attached EXAMINER'S AMENDA or declaration is deficient. A SUBSTITUTE of THIS PAPER. Drawing informalities are indicated of CORRECTION IS REQUIRE.	MENT OF NOTICE OF INFORM OATH OR DECLARATION IS F IS CHANGES INDICATED BEL	REQUIRED. OW IN THE MANNER	SET FORTI	ON THE REVERSE SIDE
 The proposed drawing correction filed REQUIRED. 	on	has been approv	ed by the e	xaminer, CORRECTION IS
 Approved drawing corrections are des REQUIRED. 	scribed by the examiner in	the attached EXAMIN	ER'S AMEN	DMENT. CORRECTION IS
d. Formal drawings are now REQUIRED.				
ny response to this letter should include in the ND ISSUE FEE DUE: ISSUE BATCH NUMBER, Detachments: Examiner's Amendment Examiner interview Summary Record, PTOL-413 Reasons for Allowance Natice of References Cited, PTO-892 Information Disclosure Citation, PTO-1449	DATE OF THE NOTICE OF ALI	of Informal Application, Pre Patent Drawings, PTO of Bonded Draftsmen	AL NUMBER. PTO-152 -948	
			10	
*				

PTOL-37 (REV. 4-89) *

File History Content Report

The following content is missing from the original file history record obtained from the United States Patent and Trademark Office. No additional information is available.

Document Date - 1999-12-28

Document Title - USPTO Grant



UNITED STATES PARTMENT OF COMMERCE Patent and Trademark Office

ASSISTANT SECRETARY AND COMMISSIONER OF PATENTS AND TRADEMARKS Washington, D.C. 20231

CHANGE OF ADDRESS/POWER OF ATTORNEY

FILE LOCATION

9200

SERIAL NUMBER 08951357

PATENT NUMBER 6006748

THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER #

909 909

THE PRACTITIONERS OF RECORD HAVE BEEN CHANGED TO CUSTOMER #

THE FEE ADDRESS HAS BEEN CHANGED TO CUSTOMER #

ON 04/23/02 THE ADDRESS OF RECORD FOR CUSTOMER NUMBER

909 IS:

PILLSBURY WINTHROP LLP 1600 TYSONS BOULEVARD MCLEAN VA 22102

AND THE PRACTITIONERS OF RECORD FOR CUSTOMER NUMBER 909 ARE:

16773	17698	18221	20508	24238	25323	27248	28429	28458	28872
						32995			35959
36004	36239	36787	37087	38821	38825	40862	41646	41835	

PTO INSTRUCTIONS: PLEASE TAKE THE FOLLOWING ACTION WHEN THE PIO INSTRUCTIONS: PLEASE TAKE THE FOLLOWING ACTION WHEN THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER NUMBER: RECORD, ON THE NEXT AVAILABLE CONTENTS LINE OF THE FILE JACKET, 'ADDRESS CHANGE TO CUSTOMER NUMBER'. LINE THROUGH THE OLD ADDRESS ON THE FILE JACKET LABEL AND ENTER ONLY THE 'CUSTOMER NUMBER' AS THE NEW ADDRESS. FILE THIS LETTER IN THE FILE JACKET. WHEN ABOVE CHANGES ARE ONLY TO FEE ADDRESS AND/OR PRACTITIONERS OF RECORD, FILE LETTER IN THE FILE JACKET. THIS FILE IS ASSIGNED TO GALL 3761 THIS FILE IS ASSIGNED TO GAU 3761.

PTO-FMD TALBOT-1/97

In the Paten

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application of

Atty. Ref.: -PTB-4398-59

Appl. No. 08/951,357

Patent No.: 6,006,748

Filed: October 16, 1997

Issued: December 28, 1999

For: VENT VALVE APPARATUS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

STATEMENT UNDER 37 C.F.R. § 3.73 (b)

ResMed Limited, an Australian		
 the assignee of the entire 	right, title, a	and interest;
27 2011 00000 00 100		nt, title and interest. The extent (by the patent application/patent identified
	the United	of the patent application/patent identified States Patent and Trademark Office at Reel
		of the patent application/patent identified
above, to the current assignee as shown 1. From:		Т
		To: States Patent and Trademark Office at
Reel , Frame		, or a copy thereof is attached.
2. From:		To:
The document was recorded i		States Patent and Trademark Office at , or a copy thereof is attached.
Additional documents in the ch	nain of title	are listed on a supplemental sheet.
Copies of assignments or other doc	uments in th	e chain of title are attached.
A Power of Attorney to prosecute a		
The undersigned has been authorized to		
application/patent.		<i>y</i>
January 8, 2008		Paul T. Bowen
Date		Typed or printed name
703-816-4019		la Br
Telephone number	-	Signature
r creptione number	Dan Ma	
	Reg. No.	38,009

1289452



PTO-SB/80 (12-03)

Approved for use through 11/30/2005, OMB 0651-0035

United States Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

The Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO BROSSO

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

\boxtimes	Practitioners associated with the Customer Number:	23117	
	OR	· ·	
_ [Practitioner(s) named below (If more than ten patent prac-	titioners are to be named, then a customer r	number must be used):
F	Name	Regis	stration
F			
-			
F			
F			
atent ap ccordan	ey(s) or agent(s) to represent the undersigned before the plications assigned only to the undersigned according to ce with 37 C.F.R. § 3.73(b).	United States Patent and Trademark Office the USPTO assignment records or assignment	(USPTO) in connection with any and all ent documents attached to this form in
atent ap ccordan	pilications assigned only to the undersigned according to ce with 37 C.F.R. § 3.73(b). se Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive Bella Vista, New South Wales	United States Patent and Trademark Office the USPTO assignment records or assignment	(USPTO) in connection with any and all rent documents attached to this form in
atent ap	pilications assigned <u>only</u> to the undersigned according to ce with 37 C.F.R. § 3.73(b). se Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive	United States Patent and Trademark Office the USPTO assignment records or assignment.	(USPTO) in connection with any and all tent documents attached to this form in
etent ap	pilications assigned only to the undersigned according to ce with 37 C.F.R. § 3.73(b). se Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive Bella Vista, New South Wales	the USPTO assignment records or assignm	(USPTO) in connection with any and all tent documents attached to this form in
A copy n each	pilications assigned only to the undersigned according to ce with 37 C.F.R. § 3.73(b). se Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive Bella Vista, New South Wales	the USPTO assignment records or assignment r	nent documents attached to this form in or equivalent) is required to be filed by one of the
A copy n each	pilcations assigned only to the undersigned according to see with 37 C.F.R. § 3.73(b). Be Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive Bella Vista, New South Wales Australia 2153 of this form, together with a statement under 3 application in which this form if the appointed pro the application in which this Power of Attorner support of the application in which this Power of Attorner SIGNAT	the USPTO assignment records or assignment r	or equivalent) is required to be filed by be completed by one of the half of the assignee, and must
A copy n each practited	pilcations assigned only to the undersigned according to see with 37 C.F.R. § 3.73(b). Be Name and Address: ResMed Limited 1 Elizabeth Macarthur Drive Bella Vista, New South Wales Australia 2153 of this form, together with a statement under 3 application in which this form if the appointed pro the application in which this Power of Attorner support of the application in which this Power of Attorner SIGNAT	the USPTO assignment records or r	or equivalent) is required to be filed by be completed by one of the half of the assignee, and must
A copy n each	pilcation in which this form if the appointed in this speciation in which this power of Attornet The individual whose eignature and title in Paul A. Green	the USPTO assignment records or r	or equivalent) is required to be filed by be completed by one of the half of the assignee, and must

This collection of information is required by 37 C,F.R. § 1.31 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U,S,C. § 122 and 37 C,F.R. § 1.14. This collection is estimated to take 3 minutes to complete, including gathering preparing, and submitting the completed application from to the USPTO. Time will vary depending upon the Individual case. Any comments on the emount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTo-9199 and selection option 2.

2301

J. 10.2001

A/N PATENT 5

ATTORNEY DOCKET NO. 03058/004001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

pplicant : Daniel H. Abelow

Serial No.: 08/243,638

Filed : May 16, 1994

Title

. 1

: CUSTOMER-BASED PRODUCT DESIGN MODULE

JUN 2 1 1994

Commissioner of Patents and Trademarks

Washington, DC 20231

APPLICATION BRANCH

INFORMATION DISCLOSURE STATEMENT

Applicant submits the references listed on the attached form PTO 1449, copies of which are enclosed.

This statement is being filed within three months of the filing date of the application. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 6/9/9+

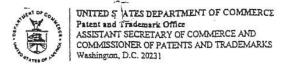
David L. Feigenbaum Reg. No. 30,378

Fish & Richardson 225 Franklin Street Boston, MA 02110-2804

Telephone: 617/542-5070 Facsimile: 617/542-8906

Date of Deposit

I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, Dr.C. 2023.



NOTICE OF FILING/CLAIM FEE(S) DUE TO ENSURE PROPER CREDIT OF FEES, PLEASE RETURN A COPY OF THIS FEE CALCULATION SHEET WITH YOUR RESPONSE.

APPLICATION NUMBER: 08/951,35

Total Fee Calculation

	Fee Code	Total # Claims	Number Extra	х	Fee	Fcc =	Total
	Sm./Lg.				Sm. Entity	Lg. Entity	
Basic Filing Fee	201/101	2002 - 100 -	1			190	790
Total Claims >20	203/103	2.(-20 =	1	X		22	110
Independent Claims >3	202/102			X		18	
Mult. Dep Claim Present	204/104					-	
Surcharge	205/105			30		130	130
English Translation	139	8					
TOTAL FEE CALCUL	ATION		8				1030
Fees due upon filing t	the application	:					
Total Filing Fees Due	= s 11030)	-				
Less Filing Fees Sub	mitted - \$_			_			
BALANCE DUE	= \$ _	1,030			8		
Office of Initial Pate	nt Examination	130/97				*	

FORM OIPE-RAM-01 (Rev 5/97)

				•				2.454.000		Application	or Dock	et Number	
	PATENT A	APPLI		N FEE D			ION RECO	RI		08/93	1,3	57	
		CL		S FILED - I	PART		Jmn 2)		SMAI TYP	L ENTITY	OR	OTHER	THAN
FOR			NUMBE	R FILED	ji ji	NUMBER	EXTRA		RATE	FEE		RATE	FEE
BASI	FEE									395.00	OR		790.00
ГОТА	L CLAIMS 25 minus 20 = * 5								x\$11=	•	OR	x\$22=	110
	PENDENT CLA		1	minu	s 3 =	•			x41=		OR	x82=	
MULT	TIPLE DEPEND	ENT CL	AIM PRE	SENT				l	+135=		OR	+270=	
lf th	e difference in co	olumn 1 is	less than 2	tero, enter "0" ir	colum	n 2			TOTAL		OR	TOTAL	400
		(Colu	mn 1)	AMENDED		RT II olumn 2)	(Column 3)	• 6	SMA	LL ENTITY	OR		R THAN ENTITY
AMENDMENT A		REMA AF	AIMS AINING TER DMENT		PRE	GHEST UMBER VIOUSLY AID FOR	PRESENT EXTRA		RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
N D	Total	. 0	20	Minus	**	25	=		x\$11=		OR	x\$22=	
ME	Independent	·	7	Minus	***	3			x41=		OR	x82=	
٩.	FIRST PRE	SENTAT	TION OF	MULTIPLE	DEPE	NDENT CL	AIM		+135=		OR	+270=	
		(Colu	ımn 1)		(0	olumn 2)	(Column 3)		TOTA ADDIT. FE		OR	TOTAL ADDIT. FEE	
ENTB		REMA AF	AIMS AINING TER DMENT		N PRE	IGHEST UMBER EVIOUSLY AID FOR	PRESENT EXTRA		RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
AMENDMENT	Total	•	7800 - 1660 00	Minus	**		=		x\$11:		OR	x\$22=	
MEN	Independent			Minus	***		=		x41=		OR	x82=	
⋖	FIRST PRE	SENTA	TION OF	MULTIPLE	DEPE	ENDENT CL	AIM		+135		OR	+270=	
	3)	(Colu	umn 1)		(0	Column 2)	(Column 3)	10	TOT. ADDIT. FI		OR	TOTAL ADDIT, FEE	
ENTC		REM/ AF	AIMS AINING TER IDMENT		N PRI	IGHEST UMBER EVIOUSLY AID FOR	PRESENT EXTRA		RATE	ADDI- TIONAL FEE		RATE	ADDI- TIONAL FEE
AMENDMENT	Total	•		Minus	**		=		x\$11:	-	OR	x\$22=	
MEN	Independent	*		Minus	***		=		x41=		OR	x82=	
Ā	FIRST PRE	SENTA	TION OF	MULTIPLE	DEP	ENDENT CL	AIM		+135	=	OR	+270=	-
* If ** If *** If	the entry in colu the "Highest Nu the "Highest Nu	mn 1 is lamber Pre	ess than the eviously Pa	ne entry in colunid For IN THI	mn 2, S SPA	write "0" in col CE is less than CE is less than	umn 3. n 20, enter "20." n 3, enter "3." highest number	four	TOT ADDIT. F	AL EE	OR	TOTAL ADDIT. FEE	

П			1	Т	er inge.	_	Г		7		1		14	
		SHEETS OF DRAWING			PARENT FILING DATE DAY VEAB								182	
DATE	DATE	CLASS	ET NUMBER		V V							FOREIGN FILING DATE		
1ST EXAMINER	2ND EXAMINER	ART UNIT	ATTORNEY DOCKET NUMBER		PARENT PATENT NUMBER							H		
	2ND E	SPECIAL HANDLING	N. W.		8						DATA	NUMBER		
U.S. DEPARTMENT OF COMMERCE Patent and Trademark Office		OATE Y YEAR	FOREIGN	CONTINUITY DATA	SERIAL NUMBE		_	,	`	`	APPLICATION	ATION SERIAL		
١.		FILING DATE	FILING FEE	CONTIN	PCT APPLICATION SERIAL NUMBER						PCT/FOREIGN APPLICATION DATA	PCT/FOREIGN APPLICATION SERIAL NUMBER		
CODING SHEET	1	APPL	SMALL ENTITY?		PCT,	C T /	C T /	C T /	C T /	C T /	ğ	PCT/FO		
PACE DATA ENTRY C		BER	CLAIMS		TION	а.	Δ.	Δ.	Δ.			Y		
PACE		11634 U.S. PTOAPPLICATION NUMBER 08/951357	CLAIMS II		PARENT APPLICATION SERIAL NUMBER			-			51	COUNTRY		
		/951357			STATUS PA							FOREIGN PRIORITY CLAIMED		
Form PTO 1130 (REV 2/94)		71694	ĺ ·		CONT S									

THOMSON INNOVATION

Thomson Innovation Patent Export, 2015-10-14 00:57:19 -0500

Table of Contents

1. US6006748A Vent valve apparatus

ı

Family 1/1

12 record(s) per family, collapsed by 8 record(s)

Record 1/8 AU1996PO3017D0 A vent valve apparatus

Publication Number: AU1996PO3017D0 19961107

Title: A vent valve apparatus

Title - DWPI:

Priority Number: AU19963017A

Priority Date: 1996-10-16

Application Number: AU19963017A

Application Date: 1996-10-16 **Publication Date:** 1996-11-07

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	А	A62	A62B	A62B0009	A62B000902

IPC Class Table - DWPI:

Assignee/Applicant: RESMED LTD

JP F Terms: JP FI Codes:

Assignee - Original:

Any CPC Table:

Туре	Invention	Additional	Version	Office
Current Current Current Current Current Current	A61M 16/201 A61M 16/06 A61M 16/208 A61M 16/209	A61M 2205/3331 A61M 2205/42 A61M 2250/00 A62B 9/02 Y10S 137/908	20130101 20130101 20130101 20130101 20130101	EP EP EP EP
Current Current Current	-	Y10T 137/2617 Y10T 137/7781 Y10T 137/7786	20150401 20150401 20150401	EP EP

1

ECLA:

Abstract:

Language of Publication: EN INPADOC Legal Status Table:

Post-Issuance (US):

Reassignment (US) Table:

Maintenance Status (US):

Litigation (US):

Opposition (EP):

License (EP):

EPO Procedural Status:

Front Page Drawing:

(No drawing/image available)

Record 2/8 US6006748A Vent valve apparatus

Publication Number: US6006748A 19991228

Title: Vent valve apparatus

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A Priority Date: 1996-10-16

Application Number: US1997951357A

Application Date: 1997-10-16 **Publication Date:** 1999-12-28

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	A	A62	A62B	A62B0009	A62B000902

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	А	A61	A61M	A61M0016	A61M001606
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	A	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: ResMed Limited, North Ryde, AU

JP F Terms: JP FI Codes:

Assignee - Original: ResMed Limited

Туре	Invention	Additional	Version	Office
Current Current Current Current	A61M 16/201 A61M 16/06 A61M 16/208 A61M 16/209	A61M 2205/3331 A61M 2205/42 A61M 2250/00 A62B 9/02	20130101 20130101 20130101 20130101	EP EP EP
Current	-	Y10S 137/908 Y10T 137/2617	20130101	EP EP

Current	Y10T 137/7781	20150401	EP
Current	Y10T 137/7786	20150401	EP

ECLA: A61M001620B | K61M001620B2 | K61M020542 | K62B000902 **Abstract**:

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20, 22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO.sub. 2 gas through the washout vent (15) over a range of gas supply pressures.

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO2 gas through the washout vent (15) over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact				
2011-06-01	FPAY	+				
Description: FEE PAYM	MENT					
2008-01-08 AS -						
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA CHANGE OF ASSIGNEE'S ADDRESS; ASSIGNOR:RESMED LIMITED; REEL/FRAME:020362/0521 2000-06-21						
2008 04 08	AC					
	AS	-				
Description: ASSIGNME	AS ENT RESMED LIMITED, AUSTRALIA (MITED; REEL/FRAME:020362/0566 200	CHANGE OF ASSIGNEE'S ADDRESS;				
Description: ASSIGNME	ENT RESMED LIMITED, AUSTRALIA	CHANGE OF ASSIGNEE'S ADDRESS;				
Description: ASSIGNME ASSIGNOR:RESMED LIN	ENT RESMED LIMITED, AUSTRALIA	CHANGE OF ASSIGNEE'S ADDRESS;				
Description: ASSIGNME ASSIGNOR:RESMED LIN	ENT RESMED LIMITED, AUSTRALIA (MITED; REEL/FRAME:020362/0566 200	CHANGE OF ASSIGNEE'S ADDRESS; 06-12-11				
ASSIGNOR:RESMED LIN 2007-06-04	ENT RESMED LIMITED, AUSTRALIA (MITED; REEL/FRAME:020362/0566 200	CHANGE OF ASSIGNEE'S ADDRESS; 06-12-11				

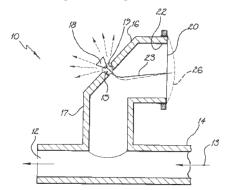
2003-06-03	FPAY	+			
Description: FEE PAYMENT					
1998-05-18	AS	-			

Post-Issuance (US): Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date		
RESMED LIMITED,BELLA VISTA, NEW SOUTH WALES,AU	RESMED LIMITED	2006-12-11	020362/0566	2008-01-08		
Conveyance: CHANGE OF ASSIGNEE'S ADDRESS						
Corresponent: PAUL T. BOWEN NIXON & VANDERHYE P.C. 901 NORTH GLEBE ROAD 11TH FLOOR ARLINGTON, VA 22203						
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-06-21	020362/0521	2008-01-08		
Conveyance: CHANGE OF A	ASSIGNEE'S ADDRESS					
Corresponent: PAUL T. BOV 22203	VEN NIXON & VANDERHYE P.C	C. 901 NORTH GLEBI	E ROAD 11TH FLOO	R ARLINGTON, VA		
RESMED LIMITED AN AUSTRALIAN COMPANY,NORTH RYDE, NEW SOUTH WALES, 2113,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	009190/0098	1998-05-18		
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).						
Corresponent: HOLLAND &	HART LLP ANDREW D. SOREN	ISEN, ESQ. 555 17TH	ST. SUITE 3200 DE	NVER, CO 80202		

Maintenance Status (US):
Litigation (US):
Opposition (EP):
License (EP):

EPO Procedural Status:



Record 3/8 AU728849B2 A vent valve apparatus

Publication Number: AU728849B2 20010118

AU199741018A 19980430

Title: A vent valve apparatus

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A Priority Date: 1996-10-16

Application Number: AU199741018A

Application Date: 1997-10-15 **Publication Date:** 2001-01-18

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	A	A61	A61M	A61M0016	A61M001620

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	A	A61	A61M	A61M0016	A61M001606
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	А	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: ResMed Limited

JP F Terms: JP FI Codes:

Assignee - Original: ResMed Limited

Any CPC Table:

ECLA:
Abstract:

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus includes a gas washout vent a vent valve (18) adapted to progressively restrict the flow area of the washout vent and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO2 gas through the washout vent (15) over a range of gas supply pressures. S S.* In:\libD]00225:KEH

7

Language of Publication: EN INPADOC Legal Status Table:

Code	INPADOC Legal Status Impact			
FGA	+			
Description: LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT)				
	FGA			

Post-Issuance (US):

Reassignment (US) Table:

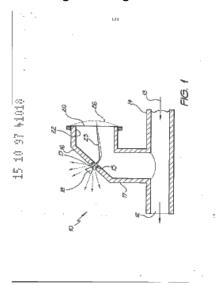
Maintenance Status (US):

Litigation (US):

Opposition (EP):

License (EP):

EPO Procedural Status:



Record 4/8 US6557555B1 Vent valve apparatus

Publication Number: US6557555B1 20030506

Title: Vent valve apparatus

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A | US1997951357A

Priority Date: 1996-10-16 | 1997-10-16 **Application Number:** US1999361495A

Application Date: 1999-07-26 **Publication Date:** 2003-05-06

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	A	A62	A62B	A62B0009	A62B000902

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	А	A61	A61M	A61M0016	A61M001606
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	A	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: ResMed Limited, North Ryde, AU

JP F Terms: JP FI Codes:

Assignee - Original: ResMed Limited

Туре	Invention	Additional	Version	Office
Current Current Current Current	A61M 16/201 A61M 16/06 A61M 16/208 A61M 16/209	A61M 2205/3331 A61M 2205/42 A61M 2250/00 A62B 9/02	20130101 20130101 20130101 20130101	EP EP EP
Current	-	Y10S 137/908 Y10T 137/2617	20130101	EP EP

Current	Y10T 137/7781	20150401	EP
Current	Y10T 137/7786	20150401	EP

ECLA: A61M001620B | K61M001620B2 | K61M020542 | K62B000902 **Abstract**:

A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve controller. The controller is adapted to progressively cause the vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply. Thereby, the vent valve substantially regulates the flow of gas through the washout vent over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Code	INPADOC Legal Status Impact			
AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA CHANGE OF ADDRESS; ASSIGNOR:RESMED LIMITED; REEL/FRAME:035114/0396 2006-12-11				
FPAY	+			
FPAY	+			
FPAY	+			
AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:013639/0721 1997-11-27				
AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA CHANGE OF ADDRESS; ASSIGNOR:RESMED LIMITED; REEL/FRAME:013639/0717 2000-01-21				
	FPAY FPAY FPAY AS LIMITED, AUSTRALIA CHANGE OF ADD FPAY AS LIMITED, AUSTRALIA ASSIGNMENT OF REEL/FRAME:013639/0721 1997-11-27 AS LIMITED, AUSTRALIA CHANGE OF ADD			

Post-Issuance (US): Reassignment (US) Table:

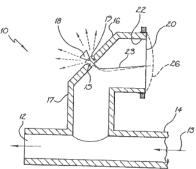
Assignee	Assignor	Date Signed	Reel/Frame	Date
RESMED LIMITED,BELLA VISTA, NEW SOUTH WALES,AU	RESMED LIMITED	2006-12-11	035114/0396	2015-03-02
Conveyance: CHANGE OF A	ADDRESS			
Corresponent: KELI HUNTEI	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3	
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-01-21	013639/0717	2003-01-07
Conveyance: CHANGE OF A	ADDRESS			
Corresponent: PILLSBURY \ MCLEAN, VA 22102	WINTHOP LLP PAUL T. BOWEN	N P.O. BOX 10500 IN	FELLECTUAL PROPE	ERTY GROUP
RESMED LIMITED,NEW SOUTH WALES,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	013639/0721	2003-01-07
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: PILLSBURY WINTHROP LLP INTELLECTUAL PROPERTY POST OFFICE BOX 10500 MCLEAN, VA 22102				

Maintenance Status (US):

Litigation (US):

Opposition (EP): License (EP):

EPO Procedural Status:



Record 5/8 US6889692B2 Vent valve assembly

Publication Number: US6889692B2 20050510

US20030127100A1 20030710

Title: Vent valve assembly

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A | US1997951357A | US1999361495A

Priority Date: 1996-10-16 | 1997-10-16 | 1999-07-26

Application Number: US2003365397A

Application Date: 2003-02-13 **Publication Date:** 2005-05-10

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	A	A61	A61M	A61M0016	A61M001620
A62B000902	А	A62	A62B	A62B0009	A62B000902

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	A	A61	A61M	A61M0016	A61M001600
A61M001606	Α	A61	A61M	A61M0016	A61M001606
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	Α	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: ResMed Limited, North Ryde, AU

JP F Terms: JP FI Codes:

Assignee - Original: ResMed Limited

Туре	Invention	Additional	Version	Office
Current Current Current	A61M 16/201 A61M 16/06 A61M 16/208	A61M 2205/3331 A61M 2205/42 A61M 2250/00	20130101 20130101 20130101	EP EP
Current Current	A61M 16/209	A62B 9/02 Y10S 137/908	20130101 20130101	EP EP

		\/TT/0.0.1T	00450404	
Current	-	Y10T 137/2617	20150401	EP
Current		Y10T 137/7781	20150401	EP
Current		Y10T 137/7786	20150401	EP

ECLA: A61M001620B | K61M001620B2 | K61M020542 | K62B000902 **Abstract**:

A vent valve apparatus for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal includes a gas washout vent, a vent valve adapted to progressively restrict the flow area of the washout vent, and a pressure sensitive vent valve controller. The controller is adapted to progressively cause the vent valve to restrict the flow area of the gas washout vent in response to increases in the pressure of the gas supply. Thereby, the vent valve substantially regulates the flow of gas through the washout vent over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:035061/0337 1997-11-27					
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0524 2000-01-24	LIMITED, AUSTRALIA CHANGE OF ADD	PRESS; ASSIGNOR:RESMED LIMITED;			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0396 2006-12-11	LIMITED, AUSTRALIA CHANGE OF ADD	PRESS; ASSIGNOR:RESMED LIMITED;			
2012-10-01	FPAY	+			
Description: FEE PAYMENT					
2008-10-09	FPAY	+			
Description: FEE PAYMENT					
2003-02-13	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:013763/0645 1997-11-27					

Post-Issuance (US):

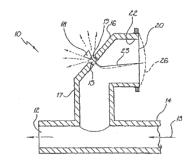
Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date		
RESMED LIMITED,BELLA VISTA, NEW SOUTH WALES,AU	RESMED LIMITED	2006-12-11	035114/0396	2015-03-02		
Conveyance: CHANGE OF ADDRESS						
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3			
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-01-24	035114/0524	2015-03-02		
Conveyance: CHANGE OF A	DDRESS					
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3			
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	035061/0337	2015-03-02		
Conveyance: ASSIGNMENT	OF ASSIGNORS INTEREST (S	EE DOCUMENT FOR	DETAILS).			
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3			
RESMED LIMITED,NORTH RYDE NEW SOUTH WALES, 2113,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	013763/0645	2003-02-13		
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).						
Corresponent: PILLSBURY V MCLEAN, VA 22102	VINTHROP LLP PAUL T. BOWE	N P.O. BOX 10500 IN	NTELLECTUAL PROF	PERTY GROUP		

Maintenance Status (US):

Litigation (US): Opposition (EP): License (EP):

EPO Procedural Status:



Record 6/8 US7059325B2 Vent assembly

Publication Number: US7059325B2 20060613

US20050166923A1 20050804

Title: Vent assembly

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A | US1997951357A | US1999361495A | US2003365397A

Priority Date: 1996-10-16 | 1997-10-16 | 1999-07-26 | 2003-02-13

Application Number: US200594174A

Application Date: 2005-03-31 **Publication Date:** 2006-06-13

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A62B000902	А	A62	A62B	A62B0009	A62B000902
A61M001620	А	A61	A61M	A61M0016	A61M001620

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	А	A61	A61M	A61M0016	A61M001606
A61M001620	A	A61	A61M	A61M0016	A61M001620
A62B000902	A	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: ResMed Limited, North Ryde, AU

JP F Terms: JP FI Codes:

Assignee - Original: ResMed Limited

Invention	Additional	Version	Office
A61M 16/201 A61M 16/06 A61M 16/208 A61M 16/209	A61M 2205/3331 A61M 2205/42 A61M 2250/00 A62B 9/02 Y10S 137/908	20130101 20130101 20130101 20130101 20130101	EP EP EP EP
	A61M 16/201 A61M 16/06 A61M 16/208	A61M 16/201 A61M 2205/3331 A61M 16/06 A61M 2205/42 A61M 16/208 A61M 2250/00 A61M 16/209 A62B 9/02	A61M 16/201 A61M 2205/3331 20130101 A61M 16/06 A61M 2205/42 20130101 A61M 16/208 A61M 2250/00 20130101 A61M 16/209 A62B 9/02 20130101

		\/TT/0.0.1T	00450404	
Current	-	Y10T 137/2617	20150401	EP
Current		Y10T 137/7781	20150401	EP
Current		Y10T 137/7786	20150401	EP

ECLA: A61M001620B | K61M001620B2 | K61M020542 | K62B000902 **Abstract:**

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO₂gas through the washout vent (15) over a range of gas supply pressures.

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO_2 gas through the washout vent (15) over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:035061/0337 1997-11-27					
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0396 2006-12-11	LIMITED, AUSTRALIA CHANGE OF ADD	PRESS; ASSIGNOR:RESMED LIMITED;			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0524 2000-01-24	LIMITED, AUSTRALIA CHANGE OF ADD	PRESS; ASSIGNOR:RESMED LIMITED;			
2013-11-13	FPAY	+			
Description: FEE PAYMENT					

2009-11-12	FPAY	+	
Description: FEE PAYMENT			

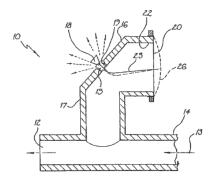
Post-Issuance (US): Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date
RESMED LIMITED,BELLA VISTA, NEW SOUTH WALES,AU	RESMED LIMITED	2006-12-11	035114/0396	2015-03-02
Conveyance: CHANGE OF A	DDRESS			
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3	
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-01-24	035114/0524	2015-03-02
Conveyance: CHANGE OF A	DDRESS			
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3	
		I	I	I
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	035061/0337	2015-03-02
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).				
Corresponent: KELI HUNTER 901 NORTH GLEBE ROAD ARLINGTON, VA 22203				

Maintenance Status (US):

Litigation (US): Opposition (EP): License (EP):

EPO Procedural Status:



Record 7/8 US8997739B2 Vent valve apparatus

Publication Number: US8997739B2 20150407

US20060185674A1 20060824

Title: Vent valve apparatus

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A | US1997951357A | US1999361495A | US2003365397A |

US200594174A

Priority Date: 1996-10-16 | 1997-10-16 | 1999-07-26 | 2003-02-13 | 2005-03-31

Application Number: US2006404870A

Application Date: 2006-04-17 **Publication Date:** 2015-04-07

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A62B000902	А	A62	A62B	A62B0009	A62B000902
A61M001620	A	A61	A61M	A61M0016	A61M001620

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	Α	A61	A61M	A61M0016	A61M001606
A61M001620	A	A61	A61M	A61M0016	A61M001620
A62B000902	А	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: Resmed Limited, Bella Vista, AU | Hollis Shane Douglas, Denistone, AU

JP F Terms: JP FI Codes:

Assignee - Original: Resmed Limited | Hollis Shane Douglas

Туре	Invention	Additional	Version	Office
Current	A61M 16/201	A61M 2205/3331	20130101	EP EP
Current	A61M 16/06 A61M 16/208	A61M 2205/42 A61M 2250/00	20130101 20130101	EP
Current Current	A61M 16/209	A62B 9/02 Y10S 137/908	20130101 20130101	EP EP

Current Current Current	-	Y10T 137/2617 Y10T 137/7781 Y10T 137/7786	20150401 20150401 20150401	EP EP
Original Original Original	A61M 16/208 A61M 16/209	A61M 2205/42 A62B 9/02 Y10S 137/908	20130101 20130101 20130101	US US US

ECLA: Abstract:

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurized above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO2 gas through the washout vent (15) over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:035061/0337 1997-11-27					
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0524 2000-01-24	LIMITED, AUSTRALIA CHANGE OF ADD	PRESS; ASSIGNOR:RESMED LIMITED;			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA CHANGE OF ADDRESS; ASSIGNOR:RESMED LIMITED; REEL/FRAME:035114/0396 2006-12-11					

Post-Issuance (US): Reassignment (US) Table:

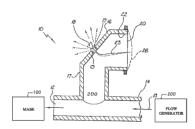
Assignee	Assignor	Date Signed	Reel/Frame	Date
RESMED LIMITED,BELLA VISTA, NEW SOUTH WALES,AU	RESMED LIMITED	2006-12-11	035114/0396	2015-03-02

Corresponent: KELI HUNTE	ER 901 NORTH GLEBE ROAD A	RLINGTON, VA 22	2203	
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-01-24	035114/0524	2015-03-02
Conveyance: CHANGE OF	ADDRESS			
Corresponent: KELI HUNTE	ER 901 NORTH GLEBE ROAD A	RLINGTON, VA 22	2203	
Corresponent: KELI HUNTE	ER 901 NORTH GLEBE ROAD A	RLINGTON, VA 22	2203	
Corresponent: KELI HUNTE RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	ER 901 NORTH GLEBE ROAD A HOLLIS, SHANE DOUGLAS	1997-11-27	035061/0337	2015-03-02

Maintenance Status (US):

Litigation (US): Opposition (EP): License (EP):

EPO Procedural Status: Front Page Drawing:



Record 8/8 US20150190606A1 VENT VALVE ASSEMBLY

Publication Number: US20150190606A1 20150709

Title: VENT VALVE ASSEMBLY

Title - DWPI: Vent valve for supply of breathable gas to human or animal has gas wash-out vent, vent valve adapted to progressively restrict flow area of wash-out vent and pressure sensitive vent

valve control

Priority Number: AU19963017A | US1997951357A | US1999361495A | US2003365397A |

US200594174A | US2006404870A

Priority Date: 1996-10-16 | 1997-10-16 | 1999-07-26 | 2003-02-13 | 2005-03-31 | 2006-04-17

Application Number: US14632230A

Application Date: 2015-02-26 **Publication Date:** 2015-07-09

IPC Class Table:

IPC	Section	Class	Subclass	Class Group	Subgroup
A61M001620	А	A61	A61M	A61M0016	A61M001620
A61M001606	А	A61	A61M	A61M0016	A61M001606
A62B000902	A	A62	A62B	A62B0009	A62B000902

IPC Class Table - DWPI:

IPC - DWPI	Section - DWPI	Class - DWPI	Subclass - DWPI	Class Group - DWPI	Subgroup - DWPI
A61M001600	А	A61	A61M	A61M0016	A61M001600
A61M001606	A	A61	A61M	A61M0016	A61M001606
A61M001620	А	A61	A61M	A61M0016	A61M001620
A62B000902	А	A62	A62B	A62B0009	A62B000902

Assignee/Applicant: RESMED LIMITED, Bella Vista, AU

JP F Terms: JP FI Codes:

Assignee - Original: RESMED LIMITED

Туре	Invention	Additional	Version	Office
Current	A61M 16/201	A61M 2205/3331	20130101	EP
Current	A61M 16/06	A61M 2205/42	20130101	EP
Current	A61M 16/208	A61M 2250/00	20130101	EP
Current	A61M 16/209	A62B 9/02	20130101	EP
Current		Y10S 137/908	20130101	EP

Current	-	Y10T 137/2617	20150401	EP
Current		Y10T 137/7781	20150401	EP
Current		Y10T 137/7786	20150401	EP
Original	A61M 16/201	-	20140204	US
Original	A61M 16/06	A61M 2205/3331	20130101	US
Original		A61M 2250/00	20130101	US

ECLA: Abstract:

A vent valve apparatus (10) for use with a system for supplying breathable gas pressurised above atmospheric pressure to a human or animal. The apparatus (10) includes a gas washout vent (15), a vent valve (18) adapted to progressively restrict the flow area of the washout vent (15), and a pressure sensitive vent valve control means (20,22,23). The control means is adapted to progressively cause the vent valve (18) to restrict the flow area of the gas washout vent (15) in response to increases in the pressure of the gas supply, thereby substantially regulating the volumetric flow of gas and/or CO_2 gas through the washout vent (15) over a range of gas supply pressures.

Language of Publication: EN INPADOC Legal Status Table:

Gazette Date	Code	INPADOC Legal Status Impact			
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED LIMITED, AUSTRALIA ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:HOLLIS, SHANE DOUGLAS; REEL/FRAME:035061/0367 1997-11-27					
2015-03-02	AS	-			
Description: ASSIGNMENT RESMED REEL/FRAME:035114/0524 2000-01-2	LIMITED, AUSTRALIA CHANGE OF ADD 4	RESS; ASSIGNOR:RESMED LIMITED;			

Post-Issuance (US): Reassignment (US) Table:

Assignee	Assignor	Date Signed	Reel/Frame	Date
RESMED LIMITED,BELLA VISTA, NEW SOUTH	RESMED LIMITED	2006-12-11	035114/0396	2015-03-02

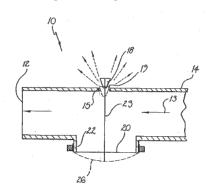
WALES,AU						
Conveyance: CHANGE OF ADDRESS						
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3			
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	RESMED LIMITED	2000-01-24	035114/0524	2015-03-02		
Conveyance: CHANGE OF A	DDRESS					
Corresponent: KELI HUNTER	R 901 NORTH GLEBE ROAD AF	RLINGTON, VA 22203	3			
RESMED LIMITED,NORTH RYDE, NEW SOUTH WALES,AU	HOLLIS, SHANE DOUGLAS	1997-11-27	035061/0367	2015-03-02		
Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).						
Corresponent: KELI HUNTER 901 NORTH GLEBE ROAD ARLINGTON, VA 22203						

Maintenance Status (US):

Litigation (US): Opposition (EP): License (EP):

EPO Procedural Status:

Front Page Drawing:





Copyright 2007-2015 THOMSON REUTERS

USPTO Main	tenance Report					
Patent Bibliog	raphic Data			10/14/2015 12:28 AM		
Patent Number:			Application Number:	08951357		
Issue Date:	12/28/1999		Filing Date:	10/16/1997		
Title:	VENT VALVI	E APPARATUS	APPARATUS			
Status:	4th, 8th and 12	th year fees paid		Entity:	LARGE	
Window Opens:	N/A	Surcharge Date:	N/A	Expiration:	N/A	
Fee Amt Due:	Window not open	Surchg Amt Due:	Window not open	Total Amt Due:	Window not open	
Fee Code:						
Surcharge Fee Code:						
Most recent events (up to 7):	06/01/2011 02/19/2008 02/19/2008 06/04/2007 07/16/2003 07/15/2003 06/03/2003	Payment of Maintenance Fee, 12th Year, Large Entity. Payor Number Assigned. Payer Number De-assigned. Payment of Maintenance Fee, 8th Year, Large Entity. Maintenance Fee Reminder Mailed. Entity Status Set to Undiscounted Payment of Maintenance Fee, 4th Year, Large Entity More Maintenance History Exists				
Address for fee purposes:	CPA GLOBL I 2318 Mill Road ALEXANDRI	d 12th Floor				