

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
24 February 2005 (24.02.2005)

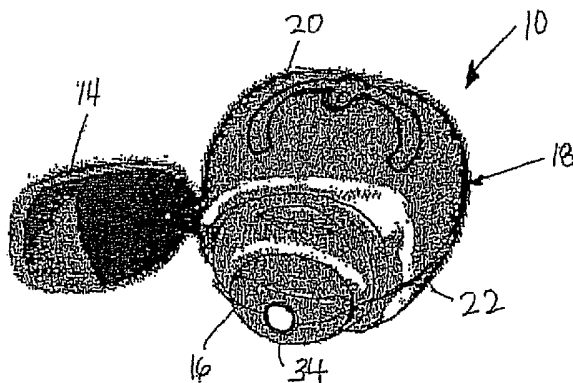
PCT

(10) International Publication Number  
WO 2005/016424 A3

- (51) International Patent Classification<sup>7</sup>: A61M 15/00
- (21) International Application Number:  
PCT/US2004/004843
- (22) International Filing Date: 20 February 2004 (20.02.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
0303870.0 20 February 2003 (20.02.2003) GB
- (71) Applicant (for all designated States except US): **IVAX CORPORATION** [US/US]; 4400 Biscayne Boulevard, Miami, FL 33137 (US).
- (72) Inventors: **BARNEY, Brian**; 50 Stortford Road, Great Dunmow, Essex CM6 1DN (GB). **O'LEARY, David**; 25 Newburgh Road, Grays, Little Thurrock, Essex RM17 6UG (GB). **PEREA-BOROBIO, Esther**; 44 Flanders Road, London W4 1NG (GB). **DICKSON, Andrew**; 415 Milwards, Harlow, Essex CM19 4SR (GB). **CHEW, Sophia**; 301 Pacific Wharf, 165 Rotherhithe Street, London SE16 5QF (GB). **STRIEBIG, Rachel**; Flat 3, Finlay House, 13 Victoria Park Square, Bethnal Green, London E2 9PB (GB).
- (74) Agent: **EMMA, Dennis, A.**; Ivax Corporation, 4400 Biscayne Boulevard, Miami, FL 33137 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:  
23 June 2005

[Continued on next page]

(54) Title: PRE-METERED DOSE MAGAZINE FOR DRY POWDER INHALER



(57) Abstract: A dry powder inhaler (10) including a housing (18) having a mouthpiece (16) and a delivery passageway connected to the mouthpiece, a magazine positioned within the housing and including a plurality of reservoirs for holding doses of dry powder, and wherein the magazine is movable within the housing so that the reservoirs are sequentially positioned within the delivery passageway of the housing upon movement of the magazine, a cover (14) connected to the housing and movable to open and close the mouthpiece of the housing, and a rake connected to the cover, extending into the housing and engageable with the magazine so that, upon the cover being moved to open the mouthpiece, the rake moves the magazine and causes one of the reservoirs of the magazine to be positioned within the delivery passageway.

WO 2005/016424 A3



---

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/004843

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61M15/00

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

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61M

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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 340 758 A (* BESPAC PLC) 1 March 2000 (2000-03-01)	1-3,6-16
Y	page 6, line 2 - line 31; figures 1-6	4,5,17
A	page 7, line 12 - line 21 page 8, line 13 - line 31	18-25
Y	US 5 619 984 A (HODSON ET AL) 15 April 1997 (1997-04-15) column 4, line 60 - column 5, line 8	4,5
Y	WO 92/05823 A (VALOIS) 16 April 1992 (1992-04-16) page 9, line 31 - line 35; figures	17
	-/--	

Further documents are listed in the continuation of box C.       Patent family members are listed in annex.

° Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p>
--	--

Date of the actual completion of the international search  <b>13 April 2005</b>	Date of mailing of the international search report  <b>2.8. 04. 2005</b>
---	--

Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  <b>Valfort, C</b>
--	---

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/004843

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/11800 A (MERIDICA LIMITED; NELSON, CRAIG, HARVEY; MARTIN, JEFFREY; SCUDAMORE, A) 14 February 2002 (2002-02-14) page 20 - page 23; figures 25-27 claim 25	1-3,6-16
A	US 5 921 237 A (EISELE ET AL) 13 July 1999 (1999-07-13) column 3, line 60 - column 4, line 6 column 5, line 5 - line 32; figures	1-25
A	WO 01/17595 A (INNOVATA BIOMED LIMITED; BRAITHWAITE, PHILIP) 15 March 2001 (2001-03-15) abstract; figures	18-25
A	US 6 029 663 A (EISELE ET AL) 29 February 2000 (2000-02-29) figures 14,15	18-25
P,X	WO 03/024514 A (ADVENT PHARMACEUTICALS PTY LTD; ALLAN, ROBERT, DAVID; PIKE, GREGORY, C) 27 March 2003 (2003-03-27) page 5, line 1 - line 12 page 5, line 34 - page 6, line 6 page 10, line 13 - line 32 claim 15; figures	1-3, 6-12,14
P,A	US 2002/073997 A1 (KEANE LAWRENCE ET AL) 20 June 2002 (2002-06-20) cited in the application abstract; figures	1-25
X	WO 94/05358 A (MEDIX LIMITED) 17 March 1994 (1994-03-17) page 21, line 10 - page 24, line 8 page 24, line 10 - line 12; figures 20-27	26-36
A	WO 93/16748 A (INNOVATA BIOMED LIMITED) 2 September 1993 (1993-09-02) abstract; figures 16,17,19,20	26-36
P,X	WO 03/066470 A (MERIDICA LIMITED; EDE, ANDREW, JOHN; CONWAY, JOHN, KELSHAW; WRIGHT, CH) 14 August 2003 (2003-08-14) page 5, line 27 - line 30 page 7, line 21 - line 23 page 9, line 11 - line 30 page 21, line 25 - line 31; figures 1d,3,9	26-32
P,X	WO 03/015857 A (MERIDICA LIMITED; EDE, ANDREW, JOHN; JENNINGS, DOUGLAS, IVAN) 27 February 2003 (2003-02-27) figures 5d,22	26,27, 29-32
	----- -/--	

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/004843

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2005/002654 A (MERIDICA LIMITED; HOUZEGO, PETER, JOHN; CONWAY, JOHN, KELSHAW; PEARL,) 13 January 2005 (2005-01-13) the whole document -----	26-36

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/004843

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

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

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional sheet

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

Remark on Protest

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

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US2004 /004843

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-25

A dry powder inhaler with a dose magazine and a mouthpiece cover, the mouthpiece cover actuating the magazine in order to put the dose in delivery position.

---

2. claims: 26-36

A dose magazine for a dry powder inhaler with deployable medicament pistons in the reservoirs in order to put the medicament dose in the delivery passageway.

---

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/004843

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2340758	A	01-03-2000	NONE	
US 5619984	A	15-04-1997	US 5740793 A	21-04-1998
			AT 138814 T	15-06-1996
			AT 224748 T	15-10-2002
			AU 643435 B2	18-11-1993
			AU 5539590 A	29-11-1990
			AU 644790 B2	23-12-1993
			AU 5558890 A	29-11-1990
			CA 2050298 A1	29-10-1990
			CA 2058764 A1	29-10-1990
			CA 2354096 A1	15-11-1990
			DE 69027319 D1	11-07-1996
			DE 69027319 T2	21-11-1996
			DE 69027679 D1	08-08-1996
			DE 69027679 T2	14-11-1996
			DE 69034007 D1	31-10-2002
			DE 69034007 T2	08-05-2003
			DK 470154 T3	21-10-1996
			DK 472598 T3	29-07-1996
			EP 0470154 A1	12-02-1992
			EP 0472598 A1	04-03-1992
			EP 0705614 A1	10-04-1996
			ES 2087911 T3	01-08-1996
			ES 2091825 T3	16-11-1996
			WO 9013327 A1	15-11-1990
			HK 1006546 A1	05-03-1999
			JP 5501505 T	25-03-1993
			JP 4504671 T	20-08-1992
			JP 3130925 B2	31-01-2001
			KR 178798 B1	01-04-1999
			NZ 233486 A	26-05-1995
			NZ 248275 A	26-05-1995
			WO 9013328 A1	15-11-1990
			US 5655523 A	12-08-1997
			US 6012454 A	11-01-2000
WO 9205823	A	16-04-1992	FR 2667509 A1	10-04-1992
			WO 9205823 A1	16-04-1992
			WO 9205824 A1	16-04-1992
			FR 2667790 A1	17-04-1992
			US 5447151 A	05-09-1995
WO 0211800	A	14-02-2002	AU 7653801 A	18-02-2002
			CA 2418906 A1	14-02-2002
			EP 1322356 A1	02-07-2003
			WO 0211800 A2	14-02-2002
			JP 2004509669 T	02-04-2004
			US 2003183230 A1	02-10-2003
US 5921237	A	13-07-1999	US 5622166 A	22-04-1997
			US 6328034 B1	11-12-2001
			AU 729272 B2	01-02-2001
			AU 3646697 A	10-02-1998
			BR 9710880 A	17-08-1999
			CA 2261172 A1	29-01-1998
			CZ 9900189 A3	12-05-1999
			EP 0925084 A1	30-06-1999



## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/004843

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 5921237	A	HU 9903819 A2	28-03-2000	
		JP 2001507949 T	19-06-2001	
		NO 990272 A	22-03-1999	
		NZ 333685 A	29-09-2000	
		NZ 505722 A	30-03-2001	
		US 2002040713 A1	11-04-2002	
		WO 9803217 A1	29-01-1998	
		AT 258450 T	15-02-2004	
		AU 695051 B2	06-08-1998	
		AU 5251096 A	18-11-1996	
		BG 62921 B1	30-11-2000	
		BG 101992 A	31-07-1998	
		BR 9608194 A	21-07-1998	
		CA 2217672 A1	31-10-1996	
		CN 1181709 A	13-05-1998	
		CZ 9703349 A3	14-01-1998	
		DE 69631419 D1	04-03-2004	
		DE 69631419 T2	11-11-2004	
		EP 0835147 A1	15-04-1998	
		HU 9801656 A2	28-10-1998	
		IL 117706 A	30-11-1999	
		JP 3574662 B2	06-10-2004	
		JP 10512788 T	08-12-1998	
		NO 974910 A	24-10-1997	
		NZ 304654 A	28-01-1999	
		PL 322909 A1	02-03-1998	
		RO 115407 B1	28-02-2000	
		RU 2162717 C2	10-02-2001	
		SK 144697 A3	04-03-1998	
		TW 384225 B	11-03-2000	
		WO 9633759 A1	31-10-1996	
		US 6029663 A	29-02-2000	
WO 0117595	A	15-03-2001	AU 779396 B2	20-01-2005
			AU 7019900 A	10-04-2001
			BR 0013700 A	07-05-2002
			CA 2382502 A1	15-03-2001
			EP 1207926 A1	29-05-2002
			WO 0117595 A1	15-03-2001
			JP 2003508165 T	04-03-2003
			NO 20021006 A	28-02-2002
			NZ 517240 A	31-10-2003
			PL 354062 A1	15-12-2003
			ZA 200201517 A	22-05-2003
			US 6029663	A
US 6328034 B1	11-12-2001			
AT 258450 T	15-02-2004			
AU 695051 B2	06-08-1998			
AU 5251096 A	18-11-1996			
BG 62921 B1	30-11-2000			
BG 101992 A	31-07-1998			
BR 9608194 A	21-07-1998			
CA 2217672 A1	31-10-1996			
CN 1181709 A	13-05-1998			
CZ 9703349 A3	14-01-1998			
DE 69631419 D1	04-03-2004			
DE 69631419 T2	11-11-2004			

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/004843

Patent document cited in search report	Publication date	Patent family member(s)	Publication date		
US 6029663	A	EP 0835147 A1	15-04-1998		
		HU 9801656 A2	28-10-1998		
		IL 117706 A	30-11-1999		
		JP 3574662 B2	06-10-2004		
		JP 10512788 T	08-12-1998		
		NO 974910 A	24-10-1997		
		NZ 304654 A	28-01-1999		
		PL 322909 A1	02-03-1998		
		RO 115407 B1	28-02-2000		
		RU 2162717 C2	10-02-2001		
		SK 144697 A3	04-03-1998		
		TW 384225 B	11-03-2000		
		US 2002040713 A1	11-04-2002		
		WO 9633759 A1	31-10-1996		
		US 5921237 A	13-07-1999		
		AU 729272 B2	01-02-2001		
		AU 3646697 A	10-02-1998		
		BR 9710880 A	17-08-1999		
		CZ 9900189 A3	12-05-1999		
		EP 0925084 A1	30-06-1999		
		HU 9903819 A2	28-03-2000		
		JP 2001507949 T	19-06-2001		
		NO 990272 A	22-03-1999		
		NZ 333685 A	29-09-2000		
		NZ 505722 A	30-03-2001		
		WO 9803217 A1	29-01-1998		
		<hr/>			
		WO 03024514	A	27-03-2003	WO 03024514 A1
CA 2460904 A1	27-03-2003				
CN 1555277 A	15-12-2004				
EP 1427465 A1	16-06-2004				
JP 2005502440 T	27-01-2005				
US 2003178024 A1	25-09-2003				
<hr/>					
US 2002073997	A1	20-06-2002	AU 7011201 A	08-01-2002	
			AU 8464301 A	02-01-2002	
			CA 2407051 A1	27-12-2001	
			CA 2407057 A1	03-01-2002	
			EP 1294420 A2	26-03-2003	
			EP 1294421 A2	26-03-2003	
			GB 2366740 A	20-03-2002	
			GB 2372215 A	21-08-2002	
			JP 2003535656 T	02-12-2003	
			JP 2004529664 T	30-09-2004	
			WO 0197889 A2	27-12-2001	
			WO 0200280 A2	03-01-2002	
			US 2004200475 A1	14-10-2004	
			US 2002088463 A1	11-07-2002	
			AT 281861 T	15-11-2004	
			AU 7011301 A	08-01-2002	
			CA 2407262 A1	03-01-2002	
			DE 60107107 D1	16-12-2004	
			EP 1330280 A2	30-07-2003	
			EP 1486227 A2	15-12-2004	
			GB 2365778 A ,B	27-02-2002	
			GB 2366208 A ,B	06-03-2002	
			GB 2365779 A ,B	27-02-2002	
JP 2004501685 T	22-01-2004				

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/004843

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002073997	A1	WO 0200281 A2	03-01-2002
		US 2002078949 A1	27-06-2002
		US 2002073996 A1	20-06-2002
		US 2002078950 A1	27-06-2002
<hr/>			
WO 9405358	A	17-03-1994	GB 2270293 A
			DE 69318027 D1
			DE 69318027 T2
			EP 0659094 A1
			WO 9405358 A2
			JP 8500750 T
			US 5562918 A
<hr/>			
WO 9316748	A	02-09-1993	AT 191649 T
			AT 269118 T
			AU 3508793 A
			BR 9305942 A
			CA 2130477 A1
			CA 2453888 A1
			CN 1082191 A ,C
			CN 1234280 A
			DE 69328358 D1
			DE 69328358 T2
			DE 69333554 D1
			DK 626869 T3
			EP 0626869 A1
			EP 0928618 A1
			ES 2145770 T3
			ES 2218894 T3
			FI 943813 A
			FI 20020690 A
			WO 9316748 A2
			GB 2278596 A ,B
			GB 2292557 A ,B
			GR 3033790 T3
			IN 181091 A1
			IN 182859 A1
			JP 3570431 B2
			JP 7506981 T
			KR 264805 B1
			MX 9300908 A1
			NO 943065 A
			NZ 249192 A
			NZ 299262 A
			PT 626869 T
			US 5778873 A
			US 5924417 A
			ZA 9301171 A
<hr/>			
WO 03066470	A	14-08-2003	GB 2385020 A
			AU 2003244510 A1
			BR 0307460 A
			CA 2472979 A1
			EP 1478579 A1
			WO 03066470 A1
<hr/>			
WO 03015857	A	27-02-2003	CA 2456502 A1
			CN 1543366 A

# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US2004/004843

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03015857     A		EP     1441790 A1	04-08-2004
		WO     03015857 A1	27-02-2003
		HU     0401029 A2	28-09-2004
		JP     2004538105 T	24-12-2004
		US     2004206773 A1	21-10-2004
WO 2005002654     A	13-01-2005	WO     2005002654 A2	13-01-2005