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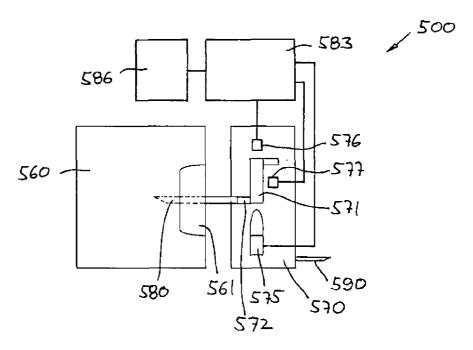
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[Continued on next page]

(54) Title: MEDICAL DEVICE ADAPTED FOR DETECTION OF DRUG CONDITION



(57) Abstract: A drug delivery device is provided, comprising a reservoir adapted to contain a liquid drug, an outlet, and expelling means for, in a situation of use, expelling a drug from the reservoir via the outlet. The device further comprises a light source (575) adapted for directing a beam of light through the drug, and detection means (576, 577) allowing a transmission characteristic of the light beam through the drug to be detected. The detecting means may be either in form of a transparent area allowing a user to inspect a portion of the device through which the light beam is directed, or light detection means used in combination with an electronic controller

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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.

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A. CLASSIFICATION OF SUBJECT MATTER A61M5/145 A61M5/31

G01N21/88

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) $A61J \quad A61M \quad A61N \quad G01N \quad G01J$

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, WPI Data, PAJ

C. DOCUMENTS CO	NSIDERED 1	TO BE	RELEVANT
			

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/099358 A (SEEDLINGS LIFE SCIENCE VENTURES, LLC) 4 December 2003 (2003-12-04) page 12, paragraph 49; figures 1-31	1,2,4,5, 8,11
X	US 6 595 962 B1 (PERTHU MICHAEL) 22 July 2003 (2003-07-22) column 7, lines 4-35	1-5,8, 10-12
X Y	WO 2004/058332 A (MEDRAD, INC) 15 July 2004 (2004-07-15) paragraphs '0011!, '0012!, '0015!, '0020! - '0022!, '0026!, '0040!, '0077!, '0082!, '0108!, '0110!, '0111!, '0117! - '0122!; figures 5-8,23-26 -/	1-5,8-10 6,7

X Further documents are listed in the continuation of Box C.	X See patent family annex.
* Special categories of cited documents: 'A' document defining the general state of the art which is not considered to be of particular relevance 'E' earlier document but published on or after the international filing date 'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) 'O' document referring to an oral disclosure, use, exhibition or other means 'P' document published prior to the international filing date but later than the priority date claimed	 "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
Date of the actual completion of the international search 10 February 2006	Date of mailing of the international search report 2 0. 02. 2006
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 Björklund, A

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	DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х		
i :	US 4 040 419 A (GOLDMAN ET AL) 9 August 1977 (1977-08-09) column 3, line 48 - column 4, line 8; figures 1-4	1-5,8, 10,11
X	US 2004/160770 A1 (RODRIGUEZ JOEL J ET AL) 19 August 2004 (2004-08-19) paragraphs '0009!, '0130!, '0131!, '0135!, '0138!; figures 1A-2E	1-6
X	US 5 330 431 A (HERSKOWITZ ET AL) 19 July 1994 (1994-07-19) column 5, lines 52-56; figures 1,4,5	1,2,6
Y	EP 1 403 519 A (NOVO NORDISK A/S) 31 March 2004 (2004-03-31) paragraphs '0084!, '0085!; figure 9a	6,7
A	US 5 928 201 A (POULSEN ET AL) 27 July 1999 (1999-07-27) column 4; claim 1; figure 1	1-25
X	WO 2004/033003 A (ALLGEYER, DEAN, 0) 22 April 2004 (2004-04-22) page 15, line 2 - page 29, line 19; claim 1; figures 1-11	13-25
X	WO 00/32259 A (SAIED, V., C) 8 June 2000 (2000-06-08) page 7, line 11 - page 9, line 18; figures 1-11P	13-25
X	US 4 006 736 A (KRANYS ET AL) 8 February 1977 (1977-02-08) column 16, lines 30-49; figure 21	13–25
X	US 4 344 429 A (GUPTON ET AL) 17 August 1982 (1982-08-17) abstract; figures 4-5B	13–25
X	US 6 592 519 B1 (MARTINEZ GONZALO) 15 July 2003 (2003-07-15) column 7, line 50 - column 8, line 8; figure 2 column 8, lines 63-67	13-25
A	US 6 111 639 A (REDUTO ET AL) 29 August 2000 (2000-08-29) abstract; figures 1,2	1-25
X,P	WO 2005/046766 A (ALARIS MEDICAL SYSTEMS, INC) 26 May 2005 (2005-05-26) the whole document	13–25
	-/	

International application No PCT/EP2005/054294

C(Continua		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х,Р	WO 2004/109262 A (ONCOLOG MEDICAL QA AB; LENNERNAES, BO) 16 December 2004 (2004-12-16) the whole document 	13-25

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INTERNATIONAL SEARCH REPORT

Box II	Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)
This Inter	rnational Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
	Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
لسسما	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:
	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 Inter	rnational Searching Authority found multiple inventions in this international application, as follows:
	see additional sheet
1. χ	As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
	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	The additional search fees were accompanied by the applicant's protest. X No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-12

Claims 1-12 define a drug delivery device comprising a reservoir, an expelling assembly for expelling a drug from the reservoir, a light conductor having a light inlet and a light outlet for conducting light from a point of entrance into the reservoir and a transparent area allowing a user to inspect a portion of the reservoir to detect a transmission characteristic of the light through the drug. This group of claims aims addresses the problem of aiding a user to verify that the drug is not deficient.

2. claims: 13-25

Claims 13-25 define a drug delivery device comprising a reservoir, an expelling assembly for expelling a drug from the reservoir, a light source adapted for directing a beam of light through the drug and detection means allowing a transmission characteristic of the light beam through the drug to be detected. This group of claims addresses the problem of providing a delivery device capable of automatically detecting deficiencies of the drug.

Information on patent family members

International application No
PCT/EP2005/054294

						101/112	1
	itent document I in search report		Publication date	<u></u>	Patent family member(s)		Publication date
WO	03099358	А	04-12-2003	AU CA EP US US	2003239400 2486935 1513571 2005171477 6979316	5 A1 . A2 7 A1	12-12-2003 04-12-2003 16-03-2005 04-08-2005 27-12-2005
US	6595962	B1	22-07-2003	AT AU DE DE WO EP	274941 1649100 69919903 69919903 0141837 1154811) A 3 D1 3 T2 7 A1	15-09-2004 18-06-2001 07-10-2004 15-09-2005 14-06-2001 21-11-2001
WO	2004058332	A	15-07-2004	EP US US	1572266 2004122369 2004254533) A1	14-09-2005 24-06-2004 16-12-2004
US	4040419	Α	09-08-1977	NONE			
US	2004160770	A1	19-08-2004	US WO	2005117335 2004074740		02-06-2005 02-09-2004
US	5330431	Α	19-07-1994	NONE			
EP	1403519	A	31-03-2004	AU WO	2003266217 2004029457		19-04-2004 08-04-2004
US	5928201	Α	27-07-1999	AT AU BR CZ DE DE WO EP HU JP KR NO PL	267621 722234 3253497 9710207 2258308 9804337 69729300 9801168 0910419 9904033 2000513973 2000022349 990024 330817	B2 7 A 8 A1 7 A3 9 D1 9 A2 8 A2 8 T A A	15-06-2004 27-07-2000 02-02-1998 09-11-1999 15-01-1998 12-05-1999 01-07-2004 04-08-2005 15-01-1998 28-04-1999 28-04-2000 24-10-2000 25-04-2000 28-01-1999 07-06-1999
WO	2004033003	Α	22-04-2004	AU EP	2003239122 1545659		04-05-2004 29-06-2005
WO	0032259	Α	08-06-2000	AU US	2352500 6312412		19-06-2000 06-11-2001
US	4006736	Α	08-02-1977	DE	2500851	L A1	16-06-1976
US	4344429	Α	17-08-1982	NONE			
US	6592519	B1	15-07-2003	DE IE US	10120280 20010293 2003199743	l A1	20-12-2001 03-04-2002 23-10-2003
110	6111639	Α	29-08-2000	NONE			

Information on patent family members

International application No
PCT/FP2005/054294

information on patent family members			PCT/EP2005/054294			
Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 2005046766	A	26-05-2005	US	200509962	4 A1	12-05-2005
WO 2004109262	Α	16-12-2004	NONE			
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