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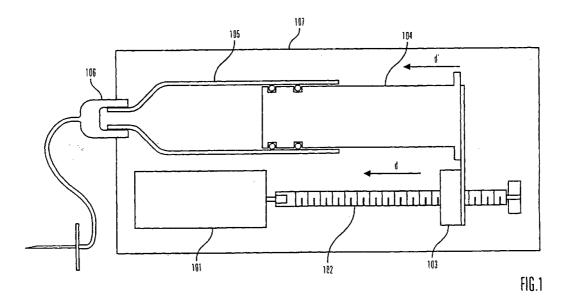
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(54) Title: METHOD AND APPARATUS FOR DETECTING OCCLUSIONS IN AN AMBULATORY INFUSION PUMP



(57) Abstract: An improved pump, reservoir (406) and reservoir piston (407) are provided for controlled delivery of fluids. A motor (403) is operably coupled to a drive member (432), such as a drive screw (404), which is adapted to advance a plunger slide (405) in response to operation of the motor. The plunger slide is removably coupled to the piston (407). A system for automatically detecting an occlusion in a medication infusion pump is provided. The electrical current to an infusion pump is measured. Based on a series of measurements of one or more variables, the infusion pump detects whether there is an occlusion in the system.



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INTERNATIONAL SEARCH REPORT

International application No PCT/US2007/023569

A. CLASSIFICATION OF SUBJECT MATTER INV. A61M5/168

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

B. FIELDS SEARCHED

 $\begin{tabular}{ll} \begin{tabular}{ll} Minimum documentation searched (classification system followed by classification symbols) \\ A61M \end{tabular}$

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
Х	US 2006/184154 A1 (MOBERG SHELDON B [US] ET AL) 17 August 2006 (2006-08-17) paragraphs [0160] - [0162], [0194], [0200] - [0202]; claims 7,13,28; figures 26-31	21-36	
X	US 2004/133166 A1 (MOBERG SHELDON B [US] ET AL) 8 July 2004 (2004-07-08) paragraphs [0098] - [0113]; figures 11-13	21–36	
X	WO 93/04284 A (ABBOTT LAB [US]) 4 March 1993 (1993-03-04) page 22, lines 12-17; figures	21	
Ρ,Χ΄	WO 2007/035567 A (LIFESCAN INC [US]; ANEX DEON [US]) 29 March 2007 (2007-03-29) page 17 - page 18; figures 11,12	21	
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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 filling 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 filling 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 24 June 2008	Date of mailing of the international search report $08/07/2008$
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 Ehrsam, Fernand

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INTERNATIONAL SEARCH REPORT

International application No PCT/US2007/023569

Category*	Citation of document, with indication, where appropriate, of the relevant passages		Relevant to claim No.
ζ .	EP 1 529 546 A (MEDEX INC [US]) 11 May 2005 (2005-05-11) paragraphs [0048] - [0072]; figures 3,4		21
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International application No. PCT/US2007/023569

INTERNATIONAL SEARCH REPORT

x No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)	
is international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:	
Claims Nos.: 1–20 because they relate to subject matter not required to be searched by this Authority, namely:	
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery	
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).	
ox No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)	
is International Searching Authority found multiple inventions in this international application, as follows:	
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 fees, this Authority did not invite payment of additional fees.	
As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:	
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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.:	
The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.	
The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.	
No protest accompanied the payment of additional search fees.	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2007/023569

Patent docu cited in searci		Publica date		Patent family member(s)	·	Publication date
US 20061	84154 /	A1 17-08	8-2006 US	2007149926	A1	28-06-2007
US 20041	33166 <i>I</i>	A1 08-07	7-2004 NON	ИЕ		
WO 93042	.84 <i>I</i>	\ 04-0:	3-1993 AU CA	2471592 2113474		16-03-1993 04-03-1993
WO 20070	35567 <i>I</i>	A 29-03	3-2007 US WO WO	2007062251 2007035654 2007035658	A2	22-03-2007 29-03-2007 29-03-2007
EP 15295	46	11-08	5-2005 AR AU BR CA CN JP KR US WO UY	PI0416170 2543955	A1 A1 A T A A1 A1	28-12-2005 26-05-2005 09-01-2007 26-05-2005 24-01-2007 11-10-2007 17-11-2006 05-05-2005 26-05-2005 30-06-2005