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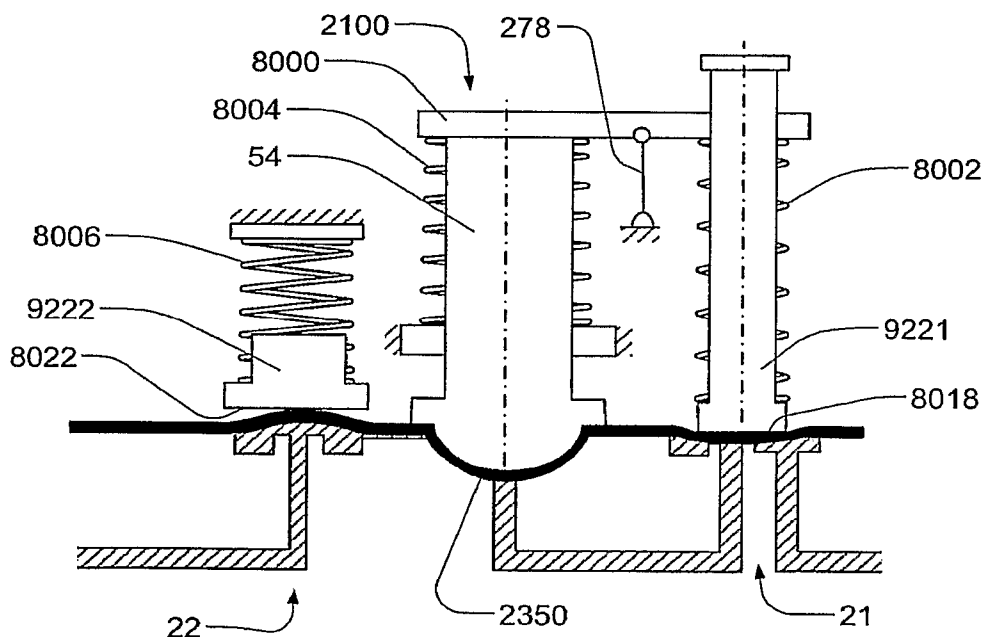
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(54) Title: PUMPING FLUID DELIVERY SYSTEMS AND METHODS USING FORCE APPLICATION ASSEMBLY



(57) Abstract: A method of dispensing a therapeutic fluid from a line includes providing an inlet line connectable to an upstream fluid source. The inlet line is in downstream fluid communication with a pumping chamber. The pumping chamber has a pump outlet. The method also includes actuating a force application assembly so as to restrict retrograde flow of fluid through the inlet while pressurizing the pumping chamber to urge flow through the pump outlet. A corresponding system employs the method.

WO 2007/095093 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/US2007/003490

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M5/142 A61M5/145 A61M5/168

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)
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	US 4 273 121 A (JASSAWALLA JAL S) 16 June 1981 (1981-06-16)	29-31, 34,61,62
Y	the whole document	32,33
Y	US 2005/273059 A1 (MERNOE MORTEN [DK] ET AL) 8 December 2005 (2005-12-08) abstract figures 6,7,12 paragraph [0096] - paragraph [0119]	32,33
X	DE 196 27 619 A1 (ORLITA PROZESSTECHNIK ORLITA G [DE]) 15 January 1998 (1998-01-15) the whole document	29, 34-37, 61,62,68
A	WO 02/04047 A (FLUIDSENSE CORP [US]) 17 January 2002 (2002-01-17) the whole document	29

Further documents are listed in the continuation of Box C.

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

Date of mailing of the international search report

1 August 2007

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/003490

Box No. 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.: 1-28
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 therapy
- 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 No. 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 allsearchable claims.
- 2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
- 3. 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.:
- 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.:

see annex

Remark on Protest

- 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 29-37,61,62,68

A system for pumping fluid through a line, wherein the motor includes a shape memory alloy.

2. claims: 38-44

A system for pumping fluid through a line, wherein the motor includes a plurality of shape-memory actuators.

3. claims: 45,46,48-53

A system for pumping fluid through a line having a downstream dispensing assembly including a resilient dispensing chamber.

4. claim: 47

A system for pumping fluid through a line which can be worn as a patch.

5. claims: 54-56,69,70

A system for pumping fluid through a line comprising a passive valve.

6. claims: 57-60

A system for pumping fluid through a line wherein at least a portion of the line is integral to a disposable component, the force application assembly is integral to a detachable reusable component, and membrane material on the disposable component is contiguous to the reusable component.

7. claim: 63

A system for pumping the fluid through a line , wherein the force application assembly includes a driving member that actuates the pump compressing member and the inlet sealing member via a sealing spring.

8. claims: 64-67

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A system for pumping the fluid through a line, comprising a driving member that actuates both the inlet sealing member and the pump compressing member, the inlet sealing member including a sealing spring.

9. claims: 71-74

A valve comprising a first portion having an inlet and an outlet, the outlet having a valve seat, a second portion having a force application member, and a membrane to separate the first and second portions. The valve opens in response to a lower pressure at the inlet and to a higher pressure in the outlet.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2007/003490

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
US 4273121	A	16-06-1981	NONE	
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