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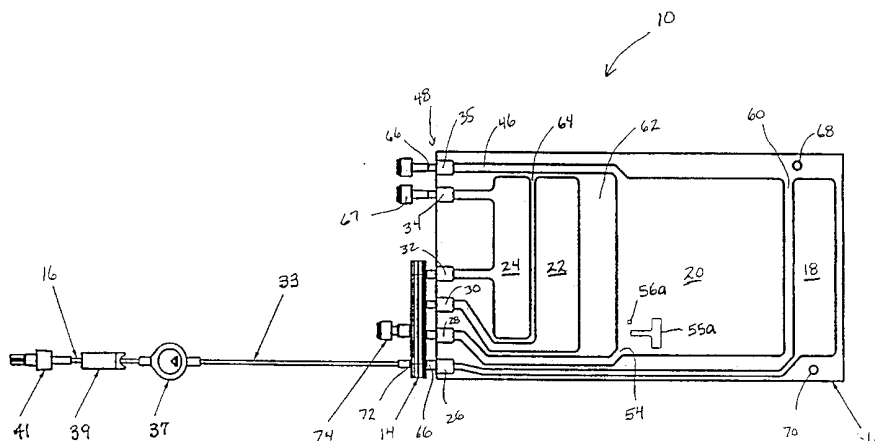
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[Continued on next page]

(54) Title: MEDICATION DELIVERY APPARATUS AND METHODS FOR INTRAVENOUS INFUSIONS



(57) Abstract: The invention provides a medication delivery system that is preconfigured to administer an infusion therapy by a mechanical pump mechanism upon user activation. The configuration of a multi-chambered flexible bag, each chamber being filled with therapeutic liquid(s), determines the sequence and amount of each liquid to be delivered when the bag is progressively compressed by a constant force spring mechanism in the pump. The spring mechanism is charged by the user manually cocking two covers of the pump housing. A mechanical timer is coupled to the constant force spring to limit the maximum rate at which the spring compresses the flexible bag. In one embodiment of the invention, the medication delivery system further includes a manifold assembly and an administration set. The manifold assembly is configured with internal conduits and valves to direct output from each chamber of the bag to an output port in the manifold, and thence into the administration set. In additional embodiments, there are provided structures in the container to alleviate pressure drop during the application of pressure to the container.



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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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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.

INTERNATIONAL SEARCH REPORT

Int. l. Application No

PCT/US 00/41860

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 A61M5/148 A61J1/00

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 A61J

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 36112 A (TANDEM MEDICAL) 22 July 1999 (1999-07-22) the whole document ---	1
X	US 4 741 736 A (BROWN ERIC W) 3 May 1988 (1988-05-03) abstract ---	1
A	EP 0 145 825 A (FIAB SYSTEM AB) 26 June 1985 (1985-06-26) abstract ---	1
A	EP 0 289 361 A (MEDISTRON LTD) 2 November 1988 (1988-11-02) abstract -----	1

Further documents are listed in the continuation of box C.

Patent family members are listed in 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

14 August 2001

Date of mailing of the international search report

29 FEB 2002

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/41860

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: 57
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.: 1-54,56,58
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:
see FURTHER INFORMATION sheet PCT/ISA/210
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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

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.:
1-54,56,58

Remark on Protest

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

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-54,56,58

In view of the large number and also the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search based on said claims is impossible. Consequently, the search has been carried out for the subject-matter which is believed to be the basis for the application, namely:

"A medication delivery system for infusion, comprising 1) a multi-chambered flexible bag for holding therapeutic liquids and 2) a mechanical pump mechanism with a constant force spring mechanism, wherein said chambers are arranged sequentially and said constant force spring mechanism progressively compresses said bag such that each chamber is activated sequentially from one end of the bag to the other".

See abstract and page 7, second paragraph.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-54,56,58

Medication delivery system for infusion comprising 1) a multi-chambered flexible bag for holding therapeutic liquids and 2) a mechanical pump mechanism with a constant force spring mechanism, wherein said chambers are arranged sequentially and said constant force spring mechanism progressively compresses said bag such that each chamber is activated sequentially from one end of the bag to the other.

See abstract and page 7, second paragraph.

2. Claim : 55

Charging disk with spring-loaded pawls.

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 00/41860

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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