

(19) World Intellectual Property Organization  
International Bureau



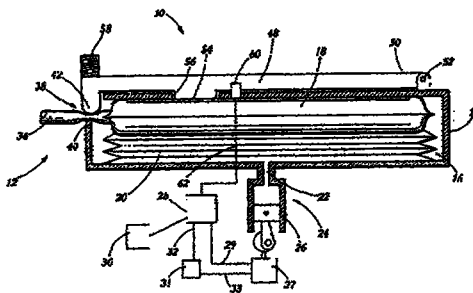
(43) International Publication Date  
18 January 2001 (18.01.2001)

PCT

(10) International Publication Number  
**WO 01/03758 A1**

- (51) International Patent Classification<sup>7</sup>: **A61M 5/155**, 5/168, 5/175
- (74) Agents: **KOWALIK, Francis, C. et al.**; Baxter International Inc., One Baxter Parkway, Deerfield, IL 60015 (US).
- (21) International Application Number: **PCT/US00/16394**
- (81) Designated States (*national*): AU, BR, CA, CN, JP, KR, SG.
- (22) International Filing Date: **15 June 2000 (15.06.2000)**
- (25) Filing Language: **English**
- (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GR, IE, IT, LU, MC, NL, PT, SE).
- (26) Publication Language: **English**
- (30) Priority Data:  
9916111.9 10 July 1999 (10.07.1999) GB  
09/410,676 1 October 1999 (01.10.1999) US
- 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.
- (71) Applicant: **BAXTER INTERNATIONAL INC.**  
[US/US]; One Baxter Parkway, Deerfield, IL 60015 (US).
- (72) Inventor: **DANBY, Hal**; Winthrop Hall, Chilton, Sudbury, Suffolk CO10 0PZ (GB).
- 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.

(54) Title: **VOLUMETRIC INFUSION PUMP WITH SERVO VALVE CONTROL**



WO 01/03758 A1

(57) Abstract: An infusion pump (10) includes a reservoir (18) containing a therapeutic liquid to be infused. The reservoir (18) includes an outlet (36) for the liquid. A volumetric air pump (24) is operatively associated with the reservoir (18) to pressurize the reservoir and thus drive liquid out the outlet (36). A valve (12) is operatively associated with the outlet (36) and prevents the flow of liquid through the outlet until a select threshold pressure is obtained in the outlet. The valve thereafter maintains an opening in the outlet that keeps the pressure in the reservoir (18) at substantially the select threshold pressure, whereby the volumetric flow rate of liquid through the outlet (36) is proportional to the volumetric flow rate of air from the volumetric air pump (24). The valve (12) varies the opening in the outlet to maintain the select pressure. The outlet preferably consists of a flexible conduit (36) having a select undeformed inner cross-sectional area and the valve (12) variably restricts the flow of liquid through the outlet by pinching a segment of the conduit to vary the inner cross-sectional area of the segment of the conduit. A method of infusing therapeutic liquid to a patient includes providing a reservoir (18) containing a therapeutic liquid, providing a volumetric air pump (24) to pressurize the reservoir to flow liquid out the liquid reservoir through an outlet (36) and maintaining a select pressure in the reservoir so that liquid through the liquid outlet is proportional to the volumetric flow rate of the volumetric air pump.