(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 December 2009 (30.12.2009)

PCT

(10) International Publication Number
WO 2009/157878 A1

(51) International Patent Classification:
A61M 1/28 (2006.01) *A61M 1/34* (2006.01)
A61M 1/16 (2006.01)

(21) International Application Number:
PCT/SG2009/000230

(22) International Filing Date:
22 June 2009 (22.06.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/074,997 23 June 2008 (23.06.2008) US

(71) Applicant *(for all designated States except US)*: **TEMASEK POLYTECHNIC** [SG/SG]; 21 Tampines Avenue 1, Singapore 529757 (SG).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **TAN, Kim Cheng** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **BLUCHEL, Christian Gert** [DE/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **CHEW, Lay Leng** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **CHUA, Kee Kiat** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **HO, Lai Ching, Helen** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **LEE, Keng Hong** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **LIN, Liutong** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **TANG, Weng Cheong, Roy** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **YUE, Keng Mun** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **WONG, Kim Jyh** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG). **CHUA, Cheng Lam** [SG/SG]; Temasek Polytechnic, Engineering Department, 21 Tampines Avenue 1, Singapore 529757 (SG).

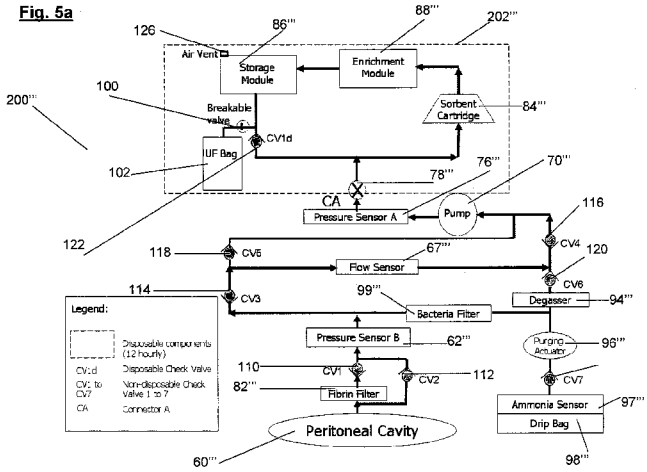
(74) Agent: **ELLA CHEONG SPRUSON & FERGUSON (SINGAPORE) PTE LTD**; P.O. Box 1531, Robinson Road Post Office, Singapore 903031 (SG).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

[Continued on next page]

(54) Title: A FLOW SYSTEM OF A DIALYSIS DEVICE AND A PORTABLE DIALYSIS DEVICE

Fig. 5a



(57) Abstract: There is provided a flow system of a dialysis device comprising: a dialysate conduit which is capable of being in fluid communication with the peritoneal cavity of a patient's body and of being in fluid communication with a flow path, said flow path allowing dialysate to flow from a patient's body to a sorbent capable of removing contaminants within said dialysate in an outflow mode and in an inflow mode returning said dialysate substantially free of contaminants to said patient's body; a pump for moving said dialysate along said flow path in both the outflow mode and inflow mode; and a plurality of valves disposed along said flow path and being configured to, in the outflow mode, allow said dialysate to flow from said dialysate conduit to said sorbent for removal of contaminants therein, and in the inflow mode, allow dialysate substantially free of said contaminants to flow back to said dialysate conduit for transmission to said patient's body. There is also provided a portable dialysis device comprising a housing having means for attachment to a patient's body, the housing comprising the flow system disclosed above.

WO 2009/157878 A1

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*