Lo0005210·6

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
A61M 1/22, 1/34

A1

(11) International Publication Number: WO 99/47189

(43) International Publication Date: 23 September 1999 (23.09.99)

(21) International Application Number: PCT/US99/04852

(22) International Filing Date: 2 March 1999 (02.03.99)

(30) Priority Data:
09/039,318 16 March 1998 (16.03.98) US

(71) Applicant: LIFE SCIENCE HOLDINGS, INC. [US/US]; 1510 West Montana Street, Chicago, IL 60614 (US).

(72) Inventor: OWEN, Donald, R.; Vital Assist, Inc., Suite I, 5701 Crawford Street, Harahan, LA 70123 (US).

(74) Agents: OLIFF, James, A. et al.; Oliff & Berridge, PLC, P.O. Box 19928, Alexandria, VA 22320 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: MODULAR COMBINED PUMP, FILTRATION, OXYGENATION AND/OR DEBUBBLER APPARATUS

(57) Abstract

A customized pump, filtration, oxygenation and/or debubbler apparatus includes a first pump module (10), a filtration module (20), an oxygenation module (30), a debubbler module (40) and/or a second pump module (50). Each module (10, 20, 30, 40, 50) is formed of stackable support members (11, 12, 14; 22, 23, 24; 32, 34-36; 41, 43, 44; 51, 53, 52) with filtration, oxygenation and/or degassing membranes (21m, 22m; 31m, 33m, 34m; 42m, 43m) interposed therebetween.

