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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 April 2003 (24.04.2003)

PCT

(10) International Publication Number
WO 03/033054 A1

(51) International Patent Classification[7]: A61M 1/16, 1/34, 1/36

(21) International Application Number: PCT/US02/33173

(22) International Filing Date: 15 October 2002 (15.10.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/981,783 17 October 2001 (17.10.2001) US
10/219,082 13 August 2002 (13.08.2002) US

(71) Applicant: **TRANSVIVO, INC.** [US/US]; 1100 Lincoln Avenue, Suite 108, Napa, CA 94558 (US).

(72) Inventors: **GORSUCH, Reynolds, G.**; 1119 State Lane, Yountville, CA 94599 (US). **PETERS, Harold, W.**; 282 Pebble Creek Court, Martinez, CA 94553 (US). **HANDLEY, Harold, H, JR.**; 53 Flicker Drive, Novato, CA 94949 (US).

(74) Agent: **HUNT, Dale, C.**; KNOBBE, MARTENS, OLSON & BEAR, LLP, 14th Floor, 2040 Main Street, Irvine, CA 92614 (US).

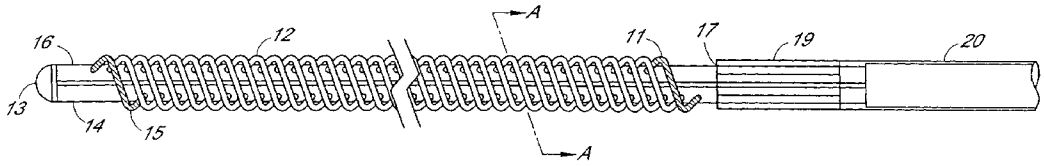
(81) Designated States *(national)*: AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

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: PLASMAPHERESIS FILTER DEVICE AND APPARATUS FOR THERAPEUTIC APHERESIS



(57) Abstract: A filter device (10) for being implanted in a blood vessel for carrying out in-vivo plasma separation comprises one or more elongated hollow tubes (14, 16) and a plurality of elongated hollow microporous fibers (12), each fiber (12) having a first and second end secured to one or more of the elongated hollow tubes (14, 16) with the interior lumen of each of the fibers communicating with the interior of the one or more of the hollow tubes (14, 16), and wherein the fiber wall has a higher mass density zone adjacent to the outer wall surface and a lower mass density zone adjacent to the inner wall surface. Apparatus for carrying out therapeutic apheresis includes the filter device (10), a multiple lumen catheter (20) secured to the proximal end of the filter device (10) having one or more lumens in fluid communication with the interior of said one or more hollow tubes (14, 16) and a plasma return lumen (52), and therapeutic apheresis apparatus (40) for removing and/or separating selected disease-related components from the separated plasma and means for directing plasma between said catheter and the selective component removal apparatus.

WO 03/033054 A1