

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 September 2006 (28.09.2006)

PCT

(10) International Publication Number
WO 2006/102431 A3

(51) International Patent Classification:

B01D 11/00 (2006.01) **B01D 61/00** (2006.01)
B01D 24/00 (2006.01) **B01D 61/24** (2006.01)
B01D 33/15 (2006.01) **B04B 3/00** (2006.01)
B01D 33/27 (2006.01) **C02F 1/38** (2006.01)
B01D 39/02 (2006.01) **C02F 1/44** (2006.01)
B01D 39/04 (2006.01) **D02G 3/00** (2006.01)
B01D 39/06 (2006.01)

(21) International Application Number:

PCT/US2006/010439

(22) International Filing Date: 22 March 2006 (22.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/664,032 22 March 2005 (22.03.2005) US
11/385,336 21 March 2006 (21.03.2006) US

(71) Applicant (for all designated States except US): **FILTRONA RICHMOND, INC.** [US/US]; 1625A Ashton Park Drive, Colonial Heights, VA 23834 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **XIANG, Jian** [US/US]; 13713 Goswick Way, Midlothian, VA (US). **WARD, Bennett, C.** [US/US]; 13500 Stonegate Road, Midlothian, VA 23113 (US). **SCHNEEKLOTH, Andreas** [DE/DE]; Sperberkamp 16a, 22175 Hamburg (DE). **PAYNE, Jackie, F., Jr.** [US/US]; 14403 Stoneburg, Chester, VA 23831 (US).

(74) Agents: **MARTINEZ DE ANDINO, J.** et al.; HUNTON & WILLIAMS, LLP, Riverfront Plaza, East Tower, 951 E. Byrd Street, Richmond, VA 23219-4074 (US).

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

(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, HU, IE, IS, IT, LT, LU, LV, MC, NL, 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:

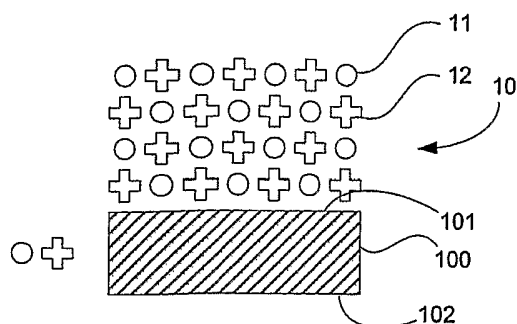
- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

9 November 2006

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: BONDED FIBER STRUCTURES FOR USE IN BLOOD SEPARATION



(57) Abstract: A barrier element for use in separating blood components is provided. The barrier element comprises a self-sustaining, fluid transmissive body comprising a plurality of thermoplastic fibers bonded to each other at spaced apart points of contact, the fibers collectively defining a tortuous fluid flow path through the fluid transmissive body from a fluid inlet surface to a fluid outlet surface, the fibers and the fluid transmissive body being configured to allow passage of at least one blood component therethrough while preventing the passage of a second blood component.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/10439

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **B01D 11/00**(2006.01),**24/00**(2006.01),**33/15**(2006.01),**33/27**(2006.01),**39/02**(2006.01),**39/04**(2006.01),**39/06**(2006.01),**61/00**(2006.01),**61/24**(2006.01);**B04B 3/00**(2006.01);**C02F 1/38**(2006.01),**1/44**(2006.01);**D02G 3/00**(2006.01)

USPC: 210/646,645,646,781,782,505;428/373

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)

U.S. : 210/646,645,646,781,782,505;428/373

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 practicable, 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	US 5,607,766 (BERGER) 4 March 1997 (04.03.1997), column 11, lines 17-21; column 14, lines 51-56; column 15, lines 28-35.	1-19



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:		"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier application or patent published on or after the international filing date	"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
"I"	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)	"&"	document member of the same patent family
"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		

Date of the actual completion of the international search

12 July 2006 (12.07.2006)

Date of mailing of the international search report

31 AUG 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Wanda Walker

Telephone No. (571) 273-1100

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/10439

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
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:
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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

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 additional fees, this Authority did not invite payment of any additional fees.
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.: 1-19

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/10439

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-19, drawn to a barrier element.

Group II, claim(s) 20-35, drawn to a method of separating a solid blood component from plasma.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical feature in Groups I and II is a self-sustaining, fluid transmissive body comprising a plurality of thermoplastic fibers bonded to each other at spaced apart points of contact, the fibers collectively defining a tortuous fluid flow path through the fluid transmissive body from a first barrier surface to a second barrier surface. This body cannot be a special technical feature under PCT Rule 13.2 because the body is shown in the prior art. US Patent 5,607,766 teaches this element as claimed in claims 1-19 and 20-35.