



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B01D 67/00, 63/00	A3	(11) International Publication Number: WO 96/17675 (43) International Publication Date: 13 June 1996 (13.06.96)
(21) International Application Number: PCT/GB95/02829 (22) International Filing Date: 5 December 1995 (05.12.95) (30) Priority Data: 9424723.6 8 December 1994 (08.12.94) GB (71) Applicant (for all designated States except US): FSM TECHNOLOGIES LIMITED [GB/GB]; 6 Dunrobin Court, North Avenue, Clydebank Business Park, Clydebank, Glasgow G81 2NT (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): HOOD, Robert, Gordon [GB/GB]; "Koinonia", 3 Station Rise, Lochwinnoch PA12 4NA (GB). (74) Agent: MURGITROYD & COMPANY; 373 Scotland Street, Glasgow G5 8QA (GB).		(81) Designated States: AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 19 December 1996 (19.12.96)
(54) Title: METHOD OF TREATING MEMBRANES (57) Abstract There is described a method of treating membranes which comprises exposing at least a portion of said membrane to a blocking moiety and then coating said membrane portion. Suitable blocking moieties include fluids (for example water) and small molecules (for example peptides, fatty acids or sugars). Suitable coatings include adhesive as well as antibodies, enzymes, lectins or other reactive molecules. Pre-treating of the membrane with the blocking moiety reduces the shear stresses on the membrane as the coating dries. In a preferred embodiment the membrane is pre-treated with water as a blocking moiety and coated with adhesive prior to insertion into an outer casing (9, 10) to form a sealed membrane unit (11).		

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 95/02829

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B01D67/00 B01D63/00

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)

IPC 6 B01D B05D

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 practical, 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	PATENT ABSTRACTS OF JAPAN vol. 8, no. 225 (C-247), 16 October 1984 & JP,A,59 112805 (NITTO DENKI KKK), 29 June 1984, see abstract & CHEMICAL ABSTRACTS, vol. 101, no. 22, 26 November 1984 Columbus, Ohio, US; abstract no. 194233, see abstract & DATABASE WPI Section Ch, Week 8432 Derwent Publications Ltd., London, GB; Class A35, AN 84-198046 see abstract --- -/--	1,2,6,7, 9,11,13, 14



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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- "P" document published prior to the international filing date but later than the priority date claimed

"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

"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

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"&" document member of the same patent family

Date of the actual completion of the international search

31 October 1996

Date of mailing of the international search report

14 -11- 1996

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 95/02829

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,4 389 363 (MOLTHOP) 21 June 1983 see abstract; claims 1-4,13; figures see column 4, line 17 - line 68 ---	1-3,6,7, 9,11-14
X	US,A,4 879 032 (ZEMLIN) 7 November 1989 see claim 1; figures see column 2, line 35 - line 38 see example 2 ---	1-3,6,7, 9,11-14
X	WO,A,93 03693 (CYGNUS THERAPEUTIC SYSTEMS) 4 March 1993 see claims 1,6,7; figure 1 see page 6, line 10 - line 35 see page 9, line 2 - line 7 ---	1,6,7,9, 13
Y	---	4,5
X	EP,A,0 245 863 (MILLIPORE CORP) 19 November 1987 see claim 12; figure 1 see page 3, line 38 - page 4, line 7 ---	1,2,9,13
X	EP,A,0 288 380 (COMMISSARIAT A L'ENERGIE ATOMIQUE) 26 October 1988 see claims 9,15,19 see column 4, line 42 - column 557 ---	1-3,9,13
X	GB,A,212 233 (FOUARD) 24 April 1924 see the whole document ---	1,4
Y	PATENT ABSTRACTS OF JAPAN vol. 13, no. 238 (C-603), 5 June 1989 & JP,A,01 047418 (SEKISUI CHEM CO LTD), 21 February 1989, see abstract & DATABASE WPI Section Ch, Week 8913 Derwent Publications Ltd., London, GB; Class J01, AN 89-098055 see abstract & CHEMICAL ABSTRACTS, vol. 112, no. 17, 23 April 1990 Columbus, Ohio, US; abstract no. 154813, see abstract ---	4,5
X	US,A,3 648 845 (RILEY) 14 March 1972 see abstract; claim 1 see column 2, line 15 - line 26 see column 4, line 35 - column 5, line 9 ---	1,9,13
A	---	4
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 95/02829

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB,A,1 357 347 (SECR OF STATE FOR TRADE AND INDUSTRY) 19 June 1974 see claims 1-9 see page 2, line 101 - line 113	1,9,13
A	---	4
A	WO,A,86 05117 (MEMTEC LTD) 12 September 1986 see abstract; claims 1-4	10
A	---	7
A	EP,A,0 338 774 (JAPAN GORE-TEX) 25 October 1989 see abstract; claim 1 see column 1, line 47 - line 52	
A	---	
A	PATENT ABSTRACTS OF JAPAN vol. 12, no. 349 (C-529) [3196] , 20 September 1988 & JP,A,63 107707 (FUJI PHOTO FILM CO LTD), 12 May 1988, see abstract	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 95/ 02829

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See annex

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 an additional fee, this Authority did not invite payment of any additional fee.
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.:

1,2,3,6,7,9-14 (partly)
4,5,6,7,9,10 and 11,13,14
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.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 95/ 02829

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

The following six groups (I-VI) of inventions do not satisfy the requirement of unity of invention.

Group I:

- independent claim 1,
- dependent claims 2, 3, 6, 7, 9, 10 (partly, insofar the blocking moiety is a fluid and the coating is an adhesive),
- independent claims 11, 13 and 14 (partly, insofar the blocking moiety is a fluid and the coating is an adhesive),
- dependent claims 12.

Group II:

- dependent claims 2, 3, 6, 8, 9, 10 (partly, insofar the blocking moiety is a fluid and the coating is an antibody, an enzyme, a lectin, or an epitope),
- independent claim 13 (partly, insofar the blocking moiety is a fluid and the coating is an antibody, an enzyme, a lectin, or an epitope).

Group III:

- dependent claims 2, 3, 6, 9, 10 (partly, insofar the blocking moiety is a fluid and the coating is a reactive molecule (dye)),
- independent claim 13 (partly, insofar the blocking moiety is a fluid and the coating is a reactive molecule (dye)).

Group IV:

- dependent claims 4, 5, 6, 7, 9, 10 (partly, insofar the blocking moiety is a small molecule and the coating is an adhesive),
- independent claims 11, 13, 14 (partly, insofar the blocking moiety is a small molecule and the coating is an adhesive).

Group V:

- dependent claims 4, 5, 6, 8, 9, 10 (partly, insofar the blocking moiety is a small molecule and the coating is an antibody, an enzyme, a lectin, or an epitope),
- independent claim 13 (partly, insofar the blocking moiety is a small molecule and the coating is an antibody, an enzyme, a lectin, or an epitope).

Group VI:

- dependent claims 4, 5, 6, 9, 10 (partly, insofar the blocking moiety is a small molecule and the coating is a reactive molecule (dye)),
- independent claim 13 (partly, insofar the blocking moiety is a small molecule and the coating is a reactive molecule (dye)).

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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