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(71) Applicants (for all designated States except US): **RENS-
SELAER POLYTECHNIC INSTITUTE** [US/US]; 110
8th Street, Troy, NY 12180-3590 (US). **MASSACHU-
SETTS INSTITUTE OF TECHNOLOGY** [US/US]; 77
Massachusetts Avenue, Cambridge, MA 02139 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BELFORT,
Georges** [US/US]; 162 Font Grove Road, Slingerlands,
NY 12159 (US). **KILDUFF, James** [US/US]; 54 White
Street, Saratoga Springs, NY 12866 (US). **ZHOU,**

Mingyan [CN/US]; 2209 16th Street, Troy, NY 12180
(US). **ANDERSON, Daniel** [US/US]; 28 Red Oak Drive,
Sudbury, MA 01776 (US). **LANGER, Robert** [US/US];
98 Montvale Road, Newton, MA 02459 (US).

(74) Agents: **GOLDMAN, Michael, L.** et al; Nixon Peabody
Llp, 1100 Clinton Square, Rochester, NY 14604-1792
(US).

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FR, GB, GR, **HR**, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,

[Continued on next page]

(54) Title: A HIGH THROUGHPUT SCREENING METHOD AND APPARATUS TO PRODUCE MODIFIED POLYMERS
PARTICULARLY MEMBRANES

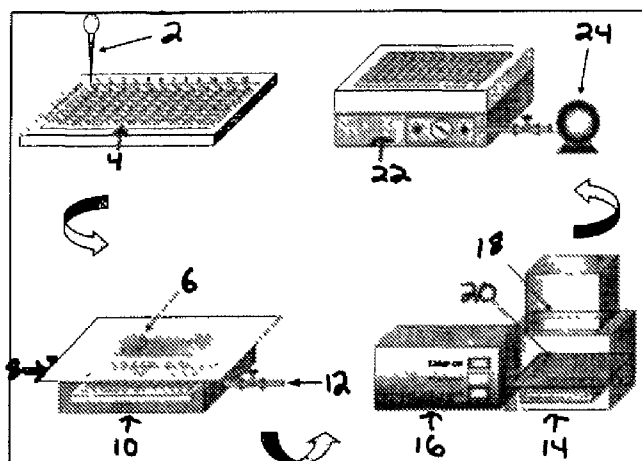


FIG. 1A

(57) Abstract: The present invention discloses a method of screening forms of monomers for effects of their polymers on a filter. This involves providing a multiple well filter, applying a monomer solution to one or more wells of the filter, polymerizing the monomer to produce a polymer-modified filter, evaluating the polymer-modified filter's performance, and comparing the performance of the polymer-modified filter to the performance of the filter to determine the effect that the polymerizing the monomer has on the performance of the filter. The present invention also relates to a method of producing a polymer-modified, multiple well filter and to an apparatus for screening forms of monomers for effects of their polymers on a filter. Also disclosed is a product which includes various monomers polymerized to a polyethersulfone as well as a method of producing such modified polyethersulfones.

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INTERNATIONAL SEARCH REPORT

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A CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B01 D 29/00 (2008 04)

USPC - 210/490

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)**

US 210/490

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

US 210/500 35, 500 41

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Google Patents Internet, Google Scholar, US Pre-grant Publications, US Patents Full-Text, US OCR Full-Text, EPO Abstracts, and JPO Databases for monomer, Belfort, kilduff, zhou, polymerS, filter, screen, well, ultraviolet, polyethersulfone, plasma, vacuum, hydrophobic, hydrophilic, charged subatomic

C DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X ----- Y	US 7,067,058 B2 (YEH et al) 27 June 2006 (27 06 2006), col 1-9	1-27 ----- 31
X ----- Y	US 6,852,769 B2 (BELFORT et al) 08 February 2005 (08 02 2005), Fig 2, col 4-5	28-30 ----- 31

D Further documents are listed in the continuation of Box C ☐*** Special categories of cited documents****"A"** document defining the general state of the art which is not considered to be of particular relevance**"E"** earlier application or patent but published on or after the international filing date**"L"** 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)**"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**"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**"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**"&"** document member of the same patent family

Date of the actual completion of the international search

12 July 2008 (12 07 2008)

Date of mailing of the international search report

22 JUL 2008

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

Lee W Young

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US 08/53866

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 **D** 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

Group 1 claims 1-31, directed to a method and apparatus for screening forms of monomers for effects of their polymers on a filter

Group 2 claims 32-39, directed to a polyethersulfone product comprising a hydrophilic or hydrophobic monomer polymerized to a polyethersulfone

Group 3 claims 40-43, directed to a method of producing a modified polyethersulfone

-see supplemental 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 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
Group 1 claims 1-31, directed to a method and apparatus for screening forms of monomers for effects of their polymers on a filter

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
Information on patent family members

International application No

PCT/AJS 08/53866

Continuation of Box III

The inventions listed as Groups 1 - 3 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:

Group 1 claims 1-31, having independent claims 1, 18 and 28, require the screening forms of monomers for effects of their polymers on a filter comprising: providing a multiple filter, applying a monomer solution to one or more wells of the filter, polymerizing the monomer to produce a polymer modified filter, evaluating polymer modified filter's performance, and comparing the performance of the polymer modified filter to the performance of the filter without polymer modification, not required by the claims of Group 2 or Group 3.

Group 2 claims 32-39, having independent claims 32, 34, 36 and 38 require the modified polyethersulfone product comprising a hydrophobic monomer polymerized to a modified polyethersulfone, not required by the claims of Group 1.

Group 3 claims 40-43, having independent claims 40-43 require a method of making modified polyethersulfone product, not required by the claims of Group 1.

The claims of Group 1 lack unity of invention with the claims of Groups 2 and 3 a priori, as they do not share a same or corresponding special technical feature. Groups 2 and 3 are related as a product and a method of making the same, and thus share technical specifics of the product. However, the shared technical features do not represent a contribution over the prior art of US 2006/0270015 A1 to Pawlak et al. (hereinafter 'Pawlak'), which discloses modified polyethersulfone (para [0065] and [0147]). Thus, the shared technical features between Groups 2 and 3 do not represent a special technical feature making a contribution over the prior art.

Therefore, the inventions identified as Groups 1 - 3 lack unity of invention under PCT Rule 13 because they do not share a same or corresponding special technical feature.