

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 March 2003 (20.03.2003)

PCT

(10) International Publication Number
WO 03/022417 A3

(51) International Patent Classification⁷: **B01J 19/00**

(21) International Application Number: PCT/US02/21860

(22) International Filing Date: 26 June 2002 (26.06.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/301,493 27 June 2001 (27.06.2001) US

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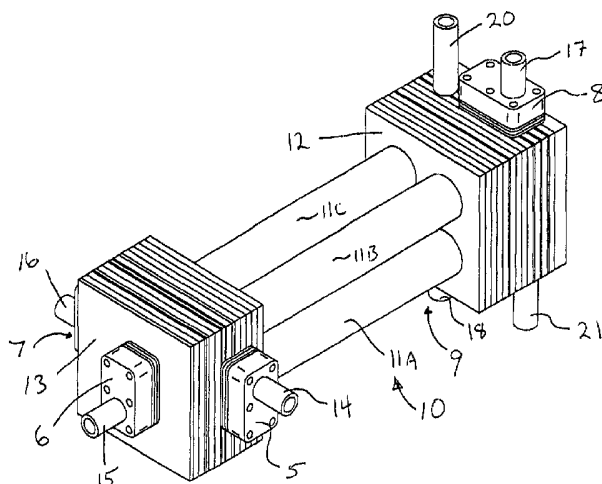
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, 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, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: MODULAR MICRO-REACTOR ARCHITECTURE AND METHOD FOR FLUID PROCESSING DEVICES



(57) Abstract: A modular fluid processing architecture (10) is provided that consists of a matrix of nested tubes or processor modules (11A-D) secured between end block manifolds (12 & 13). Multiple chemical reactors may be housed in the annular spaces formed by the nesting of the tubes, and the processes may be integrated through flow splitting, mixing, switching and heat exchange in the manifolds. A flow switching system (5-9) may provide the ability to switch the flows on or off in individual processors or in banks of such processors. The switching may effect the operation of some or all of the processes. Such switching can facilitate rapid and close following of demand for the processor output while allowing each processor to run within a range of high efficiency, since processors may be turned off or on in response to falling or rising demand for the output.



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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

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.

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

8 May 2003

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/21860

| A. CLASSIFICATION OF SUBJECT MATTER IPC(7) :B01J 19/00 US CL :Please See Extra Sheet. 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. : 422/129, 130, 236 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) EAST | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | US 5,534,328 A (ASHMEND et al.) 09 JULY 1996. | 1-19 |
| A | US 5,595,712 A (HARBSTER et al.) 21 JANUARY 1997. | 1-19 |
| A | US 5,811,062 A (WEGENG et al.) 22 SEPTMEBER 1998. | 1-19 |
| A | US 5,961, 932 A (GHOSH et al.) 05 OCTOBER 1999. | 1-19 |
| A | US 6,192,596 B1 (BENNETT et al.) 27 FEBRUARY 2001. | 1-19 |
| A | US 6,033,793 A (WOODS et al.) 07 MARCH 2000. | 1-19 |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex. | | |
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| Date of the actual completion of the international search 09 MARCH 2003 | Date of mailing of the international search report 18 MAR 2003 | |
| Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230 | Authorized officer BRIAN SINES Telephone No. (703) 308-0661 | |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/21860

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| A | US 5,938,800 A (VERRILL et al.) 17 AUGUST 1999. | 1-19 |
| A | US 5,861,137 A (EDLUND) 19 JUNE 1999. | 1-19 |
| A | US 5,580,523 A (BARD) 03 DECEMBER 1996. | 1-19 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/21860

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international 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:

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.:

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.