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C02F 1/32 (2006.01) *C02F 1/78* (2006.01)
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- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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21 January 2010

(54) **Title:** VERSATILE WATER PURIFICATION SYSTEMS AND METHODS

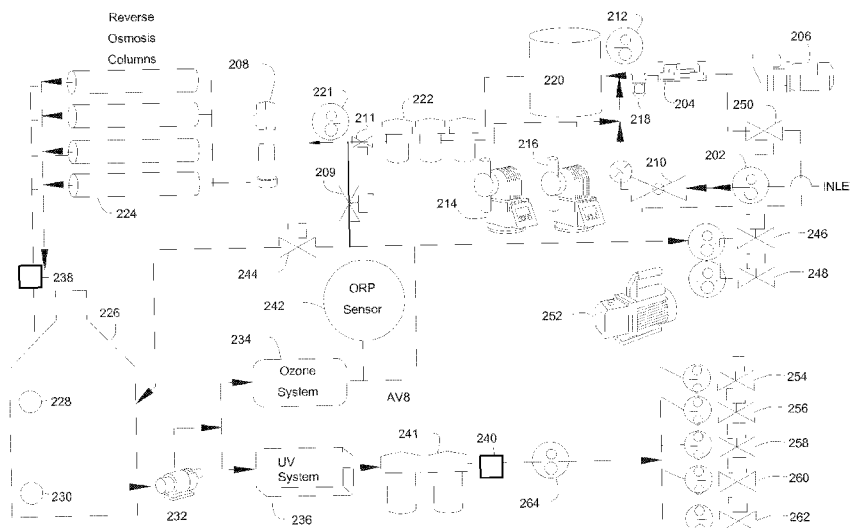


FIG. 2

(57) **Abstract:** A water purification system and method includes a first delivery pump to maintain a flow of water into a multi media filter, which filters the pumped water, which is then pumped by a reverse osmosis pump through a plurality of reverse osmosis columns to reduce particulate matter. The water is then passed to a buffer tank, where a second delivery pump pumps water to an ozone system. A first output path passes the ozonated water from the ozone system to the buffer tank via a first valve. A second output path passes ozonated water from the ozone system via a second valve to a bottle washing station. A UV system receives water from the buffer tank and kills bacteria in the water prior to dispensing for drinking. A mineralization system receives water from the UV system and adds minerals to the water prior to dispensing. A computer controls the system.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/39668

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B01D 61/02; C02F 1/32; C02F 1/44; C02F 1/78 (2009.01) USPC - 210/652, 748, 760 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(8) - B01D 61/02; C02F 1/32; C02F 1/44; C02F 1/78 (2009.01) USPC - 210/652, 748, 760 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC - 210/143, 202, 257.1, 257.2, 258, 259, 652, 748, 760 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST (PGPB, USPT, USOC, EPAB, JPAB); GOOGLE Scholar; GOOGLE Patents for tenne, gil, pump, chlorine, antiscalant, filter, osmosis, pump, columns, buffer, ozone, UV, ultraviolet, bottle, wash\$, sensor, electroconduct\$, particulate, add\$ minerals, vacuum, water.																
C. DOCUMENTS CONSIDERED TO BE RELEVANT																
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>US 2005/0139530 A1 (HEISS) 30 June 2005 (30.06.2005); Fig 1; para [0026]-[0042].</td> <td>1-14</td> </tr> <tr> <td>Y</td> <td>US 5,597,487 A (VOGEL et al.) 28 January 1997 (28.01.1997); Fig 1, 2; col 3, ln 34-42; col 5, ln 13-65; col 6, ln 39-59.</td> <td>1-14</td> </tr> <tr> <td>Y</td> <td>US 2005/0242036 A1 (HARRIS et al.) 03 November 2005 (03.11.2005); para [0398].</td> <td>5, 6, 12, 13</td> </tr> <tr> <td>Y</td> <td>US 5,180,438 A (HOCKH et al.) 19 January 1993 (19.01.1993); col 1, ln 13-24; col 7, ln 61-68.</td> <td>7, 14</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	US 2005/0139530 A1 (HEISS) 30 June 2005 (30.06.2005); Fig 1; para [0026]-[0042].	1-14	Y	US 5,597,487 A (VOGEL et al.) 28 January 1997 (28.01.1997); Fig 1, 2; col 3, ln 34-42; col 5, ln 13-65; col 6, ln 39-59.	1-14	Y	US 2005/0242036 A1 (HARRIS et al.) 03 November 2005 (03.11.2005); para [0398].	5, 6, 12, 13	Y	US 5,180,438 A (HOCKH et al.) 19 January 1993 (19.01.1993); col 1, ln 13-24; col 7, ln 61-68.	7, 14	
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<input type="checkbox"/> Further documents are listed in the continuation of Box C.																
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"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 13 September 2009 (13.09.2009)	Date of mailing of the international search report 21 SEP 2009															
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 PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774															

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/39668

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:

Group I: claims 1-14

Group II: claims 15-21

--- see extra sheet for details ---

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.:
1-14

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

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Box III continued

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: claims 1-14: directed to a water purification system comprising: pumps, filters, tanks, an ozone system, an ultraviolet system, a mineralization system; several of which are controlled by a computer.

Group II: claims 15-21: directed to a raft comprising: a platform coupled to floatation devices, a system of walls, a submersible pump, a centrifuge for directing away refuse, and an outlet pipe.

The inventions listed as Groups I - 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:

Group I does not include the inventive concept of a raft comprising: a platform coupled to floatation devices, a system of walls, a submersible pump, a centrifuge for directing away refuse, and an outlet pipe, as required by Group II.

Group II does not include the inventive concept of a water purification system comprising: pumps, filters, tanks, an ozone system, an ultraviolet system, a mineralization system; several of which are controlled by a computer, as required by Group I.

Therefore, the listed inventions lack unity of invention under PCT Rule 13 because they do not share a same or corresponding special technical feature.