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(81) Designated States (unless otherwise indicated, for every
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 BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
 DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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 KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
 ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
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 TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
 EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
 MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

[Continued on next page]

(54) Title: DUAL FLOW SORBENT CARTRIDGE

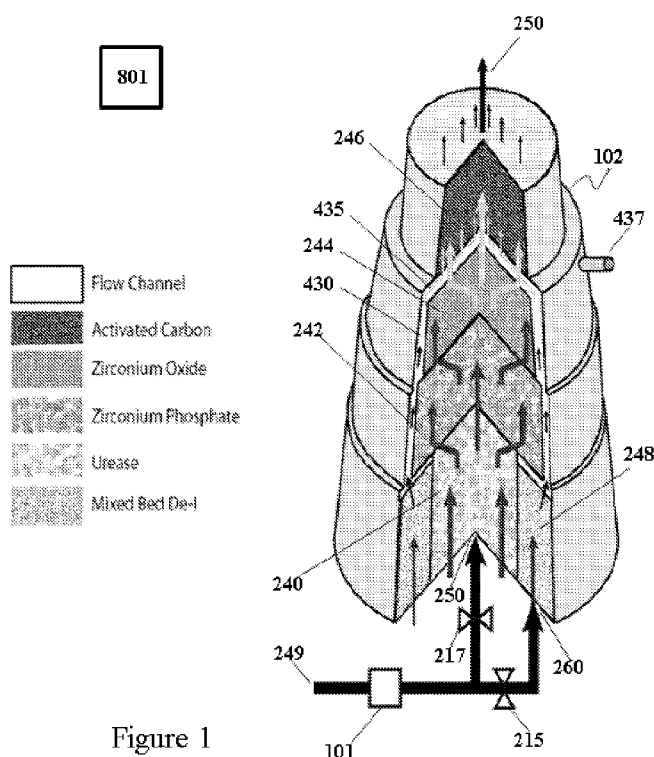


Figure 1

(57) Abstract: Disclosed are systems and methods for the performance of kidney replacement therapy having or using a dialyzer, control components, a sorbent cartridge with at least two separate flow paths, and fluid reservoirs configured to be of a weight and size suitable to be worn or carried by an individual requiring treatment. The system for performing kidney replacement therapy has a controlled compliance dialysis circuit, where a control pump controls the bi-directional movement of fluid across a dialysis membrane. The dialysis circuit and an extracorporeal circuit for circulating blood are in fluid communication through the dialysis membrane. The flux of fluid moving between the extracorporeal circuit and the dialysis circuit is modified by the rate at which the control pump is operating such that a rate of ultrafiltration and convective clearance can be controlled. The system provides for the monitoring of an inlet and outlet conductivity of the sorbent cartridge to provide a facility to quantify or monitor the removal of urea by the sorbent cartridge.



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). **(88) Date of publication of the international search report:**
16 May 2013

Published:

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A. CLASSIFICATION OF SUBJECT MATTER*A61M 1/34(2006.01)i, A61M 1/14(2006.01)i, A61M 1/10(2006.01)i, A61J 1/06(2006.01)i*

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)

A61M1/34, B01D61/48, B01D61/44, C07C273/02, B01J19/24

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: sorbent cartridge, dual flow, flow path, communication, kidney, hemodialysis, hemofiltration.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0216045 A1 (SINGH, VISHNU D.) 27 August 2009 See claims 1, 17.	1-49, 52-77
A	US 2011-0048949 A1 (DING, YUANPANG SAMUEL et al.) 03 March 2011 See claims 1 & 17; paragraph [0027].	1-49, 52-77
A	US 2011-0009798 A1 (KELLY, THOMAS et al.) 13 January 2011 See claim 1; paragraph [0128].	1-49, 52-77



Further documents are listed in the continuation of Box C.



See patent family annex.

* 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 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

27 FEBRUARY 2013 (27.02.2013)

Date of mailing of the international search report

28 FEBRUARY 2013 (28.02.2013)

Name and mailing address of the ISA/KR



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INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US2012/051946**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.: 50-51
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:

Claim 50 is directed to the system of claim 40, but the system is not mentioned in claim 40. Claim 51 depends on claim 50. Therefore, it is not possible to clearly define the subject matter for which protection is sought for claims 50-51.
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:

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 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/US2012/051946

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International application No.

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date

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