

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 June 2006 (01.06.2006)

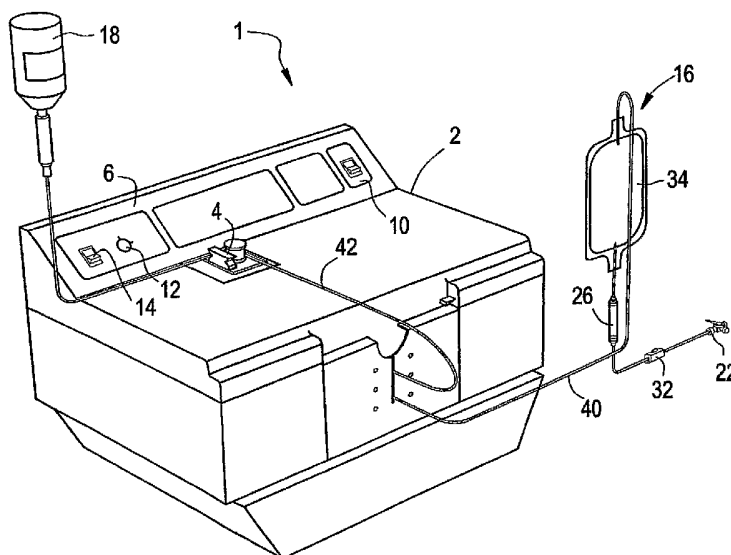
PCT

(10) International Publication Number
WO 2006/058062 A3

- (51) International Patent Classification:
A61M 1/36 (2006.01) A61L 2/00 (2006.01)
G03B 9/10 (2006.01)
- (21) International Application Number:
PCT/US2005/042427
- (22) International Filing Date:
22 November 2005 (22.11.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/630,503 22 November 2004 (22.11.2004) US
60/638,286 21 December 2004 (21.12.2004) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:
US 60/630,503 (CIP)
Filed on 22 November 2004 (22.11.2004)
US 60/638,286 (CIP)
Filed on 21 December 2004 (21.12.2004)
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nue, New York, NY 10017 (US).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV,
LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,
SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US
(patent), UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: BLOOD IRRADIATION SYSTEM, ASSOCIATED DEVICES AND METHODS FOR IRRADIATING BLOOD



(57) Abstract: Embodiments of the present application are directed to devices, systems and methods for irradiating fluids (e.g., blood) with ultraviolet light, and corresponding related components, systems and methods. In some embodiments of the invention, an ultraviolet blood irradiation (UBI) system is provided and may include an ultraviolet UV source providing a predetermined wave-length of radiation to provide a detrimental effect to virus and/or bacteria, an exposure chamber for exposing a predetermined volume of blood to radiation, a conduit between the UV source and the exposure chamber, a pump for pumping blood between a first location and a second location and a shutter assembly provided between the UV source and the exposure chamber providing time-metered irradiation of the blood in the chamber.

WO 2006/058062 A3



Published:

— *with international search report*

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

9 November 2006

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.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/042427

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M1/36 G03B9/10 A61L2/00

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)
A61M G03B A61L

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 574 803 A (EMMET KENNARD KNOTT) 22 January 1946 (1946-01-22) page 1, line 71 - line 81 page 2, line 81 - line 115 page 4, line 43 - line 86; figures 1,6,9 -----	1,5-7, 13,17 2-4, 8-12, 14-16,18
Y	US 6 312 593 B1 (PETRIE THOMAS R) 6 November 2001 (2001-11-06) column 4, line 43 - line 54; figure 5 -----	2-4
Y	WO 98/22150 A (BAXTER INTERNATIONAL INC) 28 May 1998 (1998-05-28) page 15, line 1 - line 6; figure 2 -----	8
A	----- -/--	

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 document 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

Date of mailing of the international search report

22 March 2006

21. 08. 2006

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/042427

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 20 2004 004263 U1 (WEBER, WALDFRIED) 19 May 2004 (2004-05-19) paragraphs [0018], [0019], [0023], [0024]; figures 1-3 -----	9-12
Y	EP 0 638 838 A (EASTMAN KODAK COMPANY) 15 February 1995 (1995-02-15)	14-16,18
X	column 3, line 51 - column 5, line 43; figures 1-7 -----	30,31
A	WO 00/74806 A (BAXTER INTERNATIONAL INC; CERUS CORPORATION) 14 December 2000 (2000-12-14) page 37, line 20 - page 40, line 16 -----	19-29

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/042427

Box 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.: 32
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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 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:

see additional 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 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.:

1-31

Remark on Protest

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

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-31.

A blood irradiation system comprising a shutter and a shutter assembly.

Problem to be solved: exposure of the flow of blood to the radiation according to a predetermined timing.

2. claims: 33-41

An administration set comprising a collection vessel, two needles and a reservoir bag.

Problem to be solved: Collection of blood and minimizing hemolysis.

3. claims: 42-45

A container for passing and/or containing blood comprising a container and a tube with a valve.

Problem to be solved: Flow rate control

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2005/042427

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