

(51) International Patent Classification:
A61M 1/00 (2006.01) *A61M 27/00* (2006.01)(21) International Application Number:
PCT/US2009/030497(22) International Filing Date:
8 January 2009 (08.01.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/019,819 8 January 2008 (08.01.2008) US(71) Applicants (for all designated States except US):
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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.

(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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

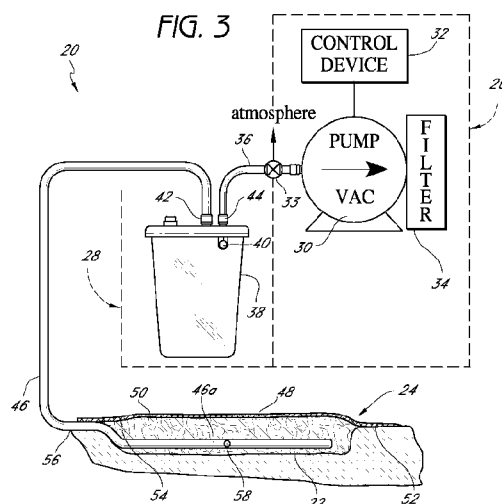
— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

[Continued on next page]

(54) Title: SUSTAINED VARIABLE NEGATIVE PRESSURE WOUND TREATMENT AND METHOD OF CONTROLLING SAME



(57) Abstract: Disclosed herein are systems and methods for providing reduced or negative pressure, and more particularly cyclical reduced pressure, to treat a wound. The system (20) can include a wound dressing (24), a fluid collection container (38), a suction source (30), filters (34), and conduits (36, 46). In addition, the system (20) can include a control device (32) and sensors. The sensors may be configured to monitor certain physiological conditions of a patient such as temperature, pressure, blood flow, blood oxygen saturation, pulse, cardiac cycle, and the like. Application of cyclical reduced pressure between two or more values below atmospheric pressure may be synchronized with the physiological conditions monitored by the sensors. Certain embodiments of the system utilize an air reservoir (160) and one or more valves (162, 164, 167) and pressure sensors or gauges (137, 165) to allow for rapid cycling of the level of reduced pressure within the wound dressing (24, 44) between two or more reduced pressure values.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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

12 November 2009

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/030497

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61M1/00 A61M27/00

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

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; PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006/114637 A (SMITH & NEPHEW, PLC) 2 November 2006 (2006-11-02) page 56, line 1 - page 58, line 28; figures 1-3	1-35
A	WO 2007/087809 A (COLOPLAST A/S) 9 August 2007 (2007-08-09) page 2, line 13 - page 4, line 29 page 8, line 4 - line 38; figures 13-15	1-35
A	US 2007/265585 A1 (JOSHI, ASHOK V.) 15 November 2007 (2007-11-15) page 4, paragraph 41 - page 4, paragraph 47; figures	1-35
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☒ 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

11 September 2009

Date of mailing of the international search report

28/09/2009

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2009/030497

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/040687 A1 (KINETIC CONCEPTS INC.) 27 February 2003 (2003-02-27) page 1, paragraph 11 - page 2, paragraph 15; figures -----	1-35
X	US 2003/212357 A1 (PACE, EDGAR ALLAN) 13 November 2003 (2003-11-13) page 3, paragraph 25 - page 4, paragraph 35; figures 1-4 -----	27-30, 32
Y	WO 00/07653 A (HILL-ROM INC.) 17 February 2000 (2000-02-17) page 7, line 2 - page 20, line 10; figures 1-3, 19-21, 30-32 -----	31, 33-35
Y	WO 2007/031757 A (SMITH & NEPHEW, PLC) 22 March 2007 (2007-03-22) page 4, line 16 - page 6, line 7 page 54, line 35 - page 66, line 34; figures -----	31, 33-35
A		27-30, 32
X		27, 28, 30, 31, 34, 35

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/030497

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.: 38-41
because they relate to subject matter not required to be searched by this Authority, namely:
The method for treating a wound described in claims 38 to 41 comprises within its scope methods of treatment of the human or animal body by therapy.
According to Art. 17(2)(a)(i) and Rule 39.1(i) PCT the ISA is not requested to perform the search for such methods.
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:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an 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.:

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-26

A sustained variable negative pressure wound treatment apparatus comprising, inter alia, a sensor configured to monitor heart activity of a patient.

2. claims: 27-37

A sustained variable negative pressure wound treatment apparatus comprising, inter alia, an air reservoir and a control valve connected to the air reservoir.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/030497

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/030497

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