

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
9 July 2009 (09.07.2009)

(10) International Publication Number  
**WO 2009/086208 A3**

PCT

(51) International Patent Classification:

A61L 31/04 (2006.01) A61L 31/18 (2006.01)  
A61L 31/14 (2006.01)

(21) International Application Number:

PCT/US2008/087846

(22) International Filing Date:

19 December 2008 (19.12.2008)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/016,342 21 December 2007 (21.12.2007) US

(71) Applicant (for all designated States except US): **MI-CROVENTION, INC.** [US/US]; 75 Columbia, Suite A, Aliso Viejo, CA 92656 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CRUISE, Gregory, M.** [US/US]; 74 San Bonifacio, Rancho Santa Margarita, CA 92688 (US). **CONSTANT, Michael, J.** [US/US]; 4 Bolero, Mission Viejo, CA 92692 (US). **KEELEY, E., Michael** [US/US]; 9581 Onset Circle, Huntington Beach, CA 92646 (US). **TERRANCE, Tran, T.** [US/US]; 100351 Mast Avenue, Westminster, CA 92683 (US).

(74) Agents: **CULLMAN, Louis, C.** et al.; K & I Gates LLP, 1900 Main Street, Suite 600, Irvine, CA 92614-7319 (US).

(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, 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).

Published:

- with international search report (Art. 21(3))
- 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:

1 April 2010

(54) Title: HYDROGEL FILAMENTS FOR BIOMEDICAL USES

(57) Abstract: Described herein are apparatus, compositions, systems and associated methods to occlude structures and malformations with radiopaque hydrogel filaments with delayed controlled rates of expansion permitting the repositioning of the device once inside the structure or malformation. Further described is a device for implantation in an animal comprising a difunctional, low molecular weight ethylenically unsaturated shapeable macromer; an ethylenically unsaturated monomer; and a radiopaque element, wherein said device contains no support members. Methods of forming such devices are also disclosed.



WO 2009/086208 A3

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2008/087846

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. A61L31/04      A61L31/14      A61L31/18		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) 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		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/043552 A1 (BIOCURE INC [US]; CHAOUK HASSAN [US]; ASFAW BRUKTAWIT [US]) 30 May 2003 (2003-05-30) page 4, line 10 - line 29 page 5, line 31 - line 32 page 6 page 7, lines 4, 10 - line 12 page 14, line 28 - line 30 page 15, line 25 - line 30 page 17, line 7 page 17, line 20 - line 21 page 19, line 19 page 20, lines 17, 26 example 1 <div style="text-align: center; margin-top: 20px;">----- -/--</div>	1-6, 11, 14-16
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.</span> <span><input checked="" type="checkbox"/> See patent family annex.</span> </div>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"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</p> <p>"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</p> <p>"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.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search  <div style="text-align: center; font-weight: bold;">11 February 2010</div>		Date of mailing of the international search report  <div style="text-align: center; font-weight: bold;">17/02/2010</div>
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-weight: bold;">Sierra Gonzalez, M</div>

# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/087846

## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/196426 A1 (CRUISE GREGORY M [US] ET AL) 8 September 2005 (2005-09-08)	1,3,5-6, 10-13, 17-18, 20,24-25
Y	claims 1, 2, 4, 5, 6, 8, 10, 13, 16-22, 33-35	7-9,19, 21-23,26
Y	US 2005/119687 A1 (DACEY RALPH G JR [US] ET AL) 2 June 2005 (2005-06-02) claims 1, 15-20, 21 paragraph [0041] - paragraph [0042] paragraph [0058]	7-9,19, 21-23,26

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/087846

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03043552	A1	30-05-2003	AU 2002359410 A1 10-06-2003 EP 1460982 A1 29-09-2004
US 2005196426	A1	08-09-2005	AU 2007216682 A1 27-09-2007 AU 2009213041 A1 08-10-2009 BR 0208034 A 25-02-2004 CA 2439925 A1 19-09-2002 CN 1617694 A 18-05-2005 CN 101024729 A 29-08-2007 EP 1372553 A1 02-01-2004 JP 2004528880 T 24-09-2004 WO 02071994 A1 19-09-2002 US 2002176880 A1 28-11-2002
US 2005119687	A1	02-06-2005	NONE