

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 March 2011 (24.03.2011)

(10) International Publication Number
WO 2011/035132 A3

(51) International Patent Classification:

A61M 29/02 (2006.01) A61M 37/00 (2006.01)
A61M 25/06 (2006.01)

(21) International Application Number:

PCT/US2010/049297

(22) International Filing Date:

17 September 2010 (17.09.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/562,511 18 September 2009 (18.09.2009) 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, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, 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, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

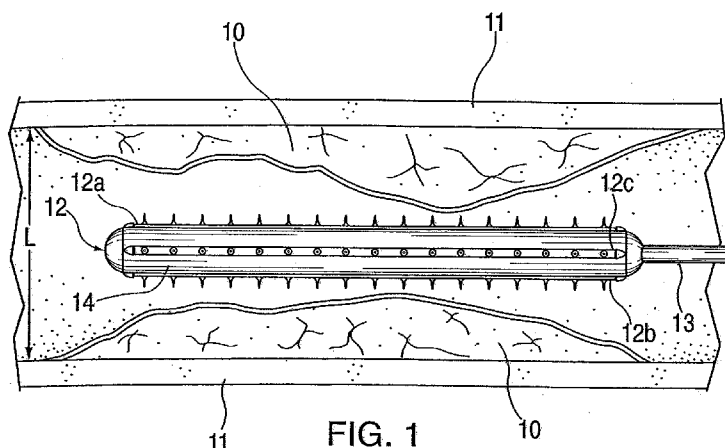
Published:

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

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

15 September 2011

(54) Title: PRE-ANGIOPLASTY SERRATION OF ATHEROSCLEROTIC PLAQUE ENABLING LOW-PRESSURE BALLOON ANGIOPLASTY & AVOIDANCE OF STENTING



(57) Abstract: A device and method for intravascular treatment of atherosclerotic plaque prior to balloon angioplasty which micropunctures the plaque with small sharp spikes acting as serrations for forming cleavage lines or planes in the plaque. The spikes may also be used to transport medication into the plaque. The plaque preparation treatment enables subsequent angioplasty to be performed at low balloon pressures of about 4 atmospheres or less, reduces dissections, and avoids injury to the arterial wall. The subsequent angioplasty may be performed with a drug-eluting balloon (DEB) or drug-coated balloon (DCB). The pre-angioplasty perforation procedure enables more drug to be absorbed during DEB or DCB angioplasty, and makes the need for a stent less likely. Alternatively, any local incidence of plaque dissection after balloon angioplasty may be treated by applying a thin, ring-shaped tack at the dissection site only, rather than applying a stent over the plaque site.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/049297**A. CLASSIFICATION OF SUBJECT MATTER***A61M 29/02(2006.01)i, A61M 25/06(2006.01)i, A61M 37/00(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)

A61M 29/02; A61M 29/00; A61M 25/10; A61B 17/20; A61F 2/06; A61B 17/32

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: atherosclerotic, balloon

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007-0213761 A1 (MURPHY et al.) 13 September 2007 See abstract, claim 1, paragraphs 50-63, and figs.1-6,	1-10
A	US 05320634 A (VIGIL, DENNIS M. et al.) 14 June 1994 See abstract, claims 1 and 10, and figs.1-4	1-10
A	US 2007-0093744 A1 (ELMALEH et al.) 26 April 2007 See abstract, paragraphs 64-73, claims 1-2, and figs.14-17	1-10
A	US 2009-0157159 A1 (SCHNEIDER PETER et al.) 18 June 2009 See abstract, claims 1 and 8, paragraphs 1-10, and figs.8-10	1-10

 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

20 JUNE 2011 (20.06.2011)

Date of mailing of the international search report

21 JUNE 2011 (21.06.2011)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/049297**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.: 11-20
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 11-20 pertain to methods for treatment of human or animal body by therapy or surgery, thus relate to a subject matter which this international Searching Authority is not required to search under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT.
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:

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/US2010/049297

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