

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 December 2007 (06.12.2007)

PCT

(10) International Publication Number
WO 2007/140320 A3

(51) International Patent Classification:
A61F 2/00 (2006.01) A61F 13/00 (2006.01)

(21) International Application Number:
PCT/US2007/069776

(22) International Filing Date: 25 May 2007 (25.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/808,558 26 May 2006 (26.05.2006) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, 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, 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, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

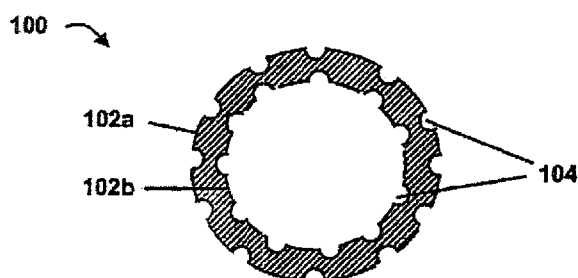
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, 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).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
20 November 2008

(54) Title: IMPLANTABLE ARTICLE, METHOD OF FORMING SAME AND METHOD FOR REDUCING THROMBOGENICITY



(57) Abstract: Endothelialization of a bodily fluid or tissue-contacting, particularly blood-contacting, surface may be accomplished to render that surface substantially non-thrombogenic. Thrombosis may also be mitigated or eliminated by providing an eroding layer on the surface that results in the removal of any thrombus formation as the layer erodes. An implantable device may utilize at least one surface having a plurality of nano-craters thereon that enhance or promote endothelialization. Additionally, an implantable device may have at least one first degradable layer for contacting bodily fluid or tissue and disposed about a central core, and at least one second degradable layer between the first degradable layer and the central core. The first degradable layer has a first degradation rate and the second degradable layer has a second degradation rate which degrades more slowly than the first degradable layer on contact with bodily fluid or tissue.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/69776

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **A61F 13/00**(2006.01),**2/00**(2006.01)

USPC: 424/422,423

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)

U.S. : 424/422,423

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 practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,848,987 (BAUDINO et al.) 15 December 1998 (15.12.1998), col. 1, lines 65-67; col. 3, lines 10-20; Fig. 2.	1 and 18
X	US 6,254,632 (WU et al.) 03 July 2001 (03.07.2001), col. 11, lines 62-65; Figs. 2A and 2B.	1, 10, 14, 18, 19 and 25
X	US 6,758,859 (DANG et al.) 06 July 2004 (06.07.2004), col. 5, line 42; col. 8, lines 10-13, 54-58; Figs. 5A and 6A.	1, 10, 15, 16, 18, 19 and 26

☐ 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 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

13 September 2008 (13.09.2008)

Date of mailing of the international search report

22 SEP 2008

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/69776

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.:
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:
Please See Continuation 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 additional fees, this Authority did not invite payment of any 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.: 1,10,11,14-16,18,19,25 and 26

- 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

International application No.
PCT/US07/69776

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 2, 17, 20 and 27, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of surface.

Group II, claim(s) 3, 4, 28 and 29, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of a adhesion-promoting molecule.

Group III, claim(s) 5, 6, 30 and 31, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of a growth-stimulating molecule.

Group IV, claim(s) 7-9 and 32-34, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of an anti-thrombotic molecule.

Group V, claim(s) 12, 13, 23 and 24, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of a leaching agent.

Group VI, claim(s) 11, 14-16, 25 and 26, drawn to an implantable device and a method of reducing thrombogenicity of an implantable device, including the specifics of nano-craters.

Group VII, claim(s) 21 and 22, drawn to a method of reducing thrombogenicity of an implantable device, including the specifics of irradiating the surface.

Group VIII, claim(s) 36-18 and 44-47, drawn to an implantable device, including the specifics of the first and second degradable layers.

Group IX, claim(s) 39, 40, 48 and 49, drawn to an implantable device, including the specifics of the third and fourth degradable layers.

Claim 1 links Inventions I-VII. The features of claim 1, which are shown either singly or in combination in US 5,848,987, lack novelty or an inventive step and do not contribute over the prior art. Claim 10 will be examined along with the elected invention only if one of Groups I-VI is elected. Claims 18 and 19 will be examined along with the elected invention only if one of Groups I-VII is elected.

Claim 35 links Invention VIII or IX. The features of claim 35, which are shown either singly or in combination in US 2003/0219562, lack novelty or an inventive step and do not contribute over the prior art. Claims 41-43 will be examined along with the elected invention only if one of Groups VIII or IX is elected.

The inventions listed as Groups I-IX do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Each of the listed groups (Groups I-IX) has special technical features not shared by the other listed groups. The special technical features exclusive to each group are listed above in the listing of the groups.