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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 July 2014 (24.07.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/113632 A3

(51) International Patent Classification:
A61B 17/00 (2006.01)

(21) International Application Number:
PCT/US2014/011980

(22) International Filing Date:
17 January 2014 (17.01.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/754,504 18 January 2013 (18.01.2013) US
13/838,166 15 March 2013 (15.03.2013) 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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, 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:
23 October 2014

(54) Title: SEALING DEVICE

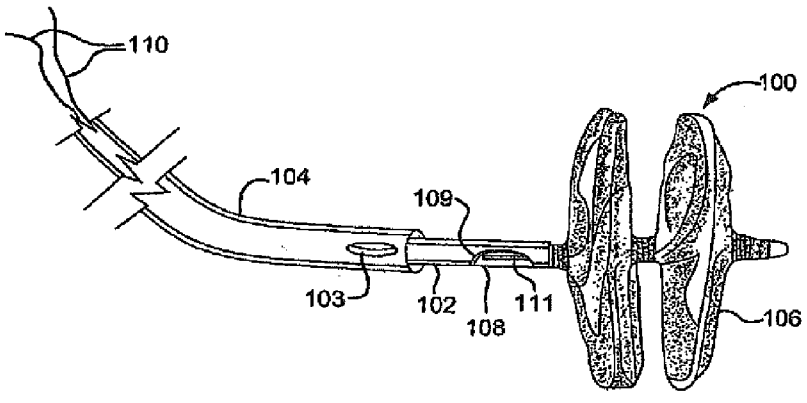

FIG. 1

(57) Abstract: A medical device for sealing a defect in a body includes a wire frame that includes a plurality of wires that form a first occluding member and a second occluding member, the wire frame including a defect-occupying portion disposed between the first occluding member and the second occluding member. The defect-occupying portion is adapted to fill a wide range of potential defect sizes, such that no more than five devices of a range of sizes are required to effectively seal a range of nominal defect sizes of approximately 8 to 35 mm.

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INTERNATIONAL SEARCH REPORT

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PCT/US2014/011980

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/00
ADD.

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)
A61B

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/143242 A1 (MASTERS STEVEN J [US]) 7 June 2012 (2012-06-07) paragraphs [0069], [0075], [0091]; claim 1; figure 20b -----	1,2,4-9, 11-20, 23-58, 60-64
X	WO 01/49185 A1 (PFM PROD FUER DIE MED AG [DE]; FREUDENTHAL FRANZ [DE]; SIEGNER GEORG [] 12 July 2001 (2001-07-12) pages 13-14; figure 6 -----	1-8, 10-15, 17-57, 59-64
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[X] Further documents are listed in the continuation of Box C.

[X] 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 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
2 September 2014	09/09/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Chopinaud, Marjorie

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

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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.: 65-67
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:

see FURTHER INFORMATION sheet PCT/ISA/210

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 all searchable 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.

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/074813 A1 (CARAG AG [CH]; THOMMEN DANIEL [CH]; FURRER SIMON [CH]; BERNHARD JEROME) 18 August 2005 (2005-08-18) pages 6-7; claim 1; figures 1,7	1,3,4, 6-8, 10-15, 17-20, 23-57, 59-64
X	US 2008/262518 A1 (FREUDENTHAL FRANZ [BO]) 23 October 2008 (2008-10-23) claim 1; figure 75	1-3,6-8, 13-15, 19,20, 23-57, 62-64
X	US 2012/071918 A1 (AMIN ZAHID [US] ET AL) 22 March 2012 (2012-03-22) paragraphs [0088] - [0098]; claim 1; figure 2	1,5-8, 12,13, 15,18, 20, 23-50, 52-57, 61-64
X	EP 2 524 653 A1 (CARAG AG [CH]) 21 November 2012 (2012-11-21) paragraphs [0036] - [0039]; claim 1; figure 1	1,3-8, 10-14, 23-57, 59-64
X	WO 01/17435 A1 (MICROVENA CORP [US]; GAINOR JOHN [US]; HELGERSON JEFF [US]; KUSLEIKA R) 15 March 2001 (2001-03-15) pages 8-9; figure 1	23-56
X	US 2008/249562 A1 (CAHILL RYAN [US]) 9 October 2008 (2008-10-09) paragraphs [0038] - [0039], [0074]; claim 1; figures 2,5,9	1,2,5-9, 12,13, 15,16, 18-50, 57,58, 61-64
X	US 2007/265656 A1 (AMPLATZ KURT [US] ET AL) 15 November 2007 (2007-11-15) paragraphs [0078] - [0082], [0084]; figure 3	23-56
X	WO 99/39646 A1 (AGA MEDICAL CORP [US]) 12 August 1999 (1999-08-12) pages 14-15; figures 1-3	23-50

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/72367 A1 (AGA MEDICAL CORP [US]) 4 October 2001 (2001-10-04) claim 1; figures 1-3	23-56
X	US 2011/301630 A1 (HENDRIKSEN PER [DK] ET AL) 8 December 2011 (2011-12-08) paragraphs [0022] - [0028]; figures 1-2	23,24, 27,29, 30,32, 33,36, 38,39, 41,42, 44,45, 47,48, 50,51, 53,54,56

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-7

A medical device for sealing a defect or structure in tissue, the medical device comprising:a wire frame that includes a plurality of wound wires that each extend from a proximal end of the wire frame to a distal end of the wire frame, the wires forming:a first occluding member;a second occluding member; anda defect-occupying portion disposed between the first occluding member and the second occluding member, wherein the defect-occupying portion is adapted to substantially fill a range of defect sizes from a largest defect size to a smallest defect size that is approximately 60% of the largest defect size, and wherein the defect-occupying portion deflects to an outer diameter that is less than about 60% of its nominal outer diameter when a radial pressure of about 0.04 N/mm2 is applied to the defect occupying portion; anda sealing member in contact with the frame.

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2. claims: 8-14

A medical device for sealing a defect or structure in a heart, the medical device comprising:a wire frame that includes a plurality of wound wires that each extend from a proximal end of the wire frame to a distal end of the wire frame, the wires forming:a first occluding member;a second occluding; anda defect-occupying portion disposed between the first occluding member and the second occluding member, wherein the defect-occupying portion is adapted to substantially fill a range of defect sizes from a largest defect size to a smallest defect size, the range being at least about 7 mm; anda sealing member in contact with the frame.

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3. claims: 15-22

A medical device for sealing a defect or structure in tissue, comprising:a frame that includes:a) a first occluding member that is adapted to conform to a geometry of a first tissue surface and to provide an apposition force against the first tissue surface,b) a second occluding member that is adapted to conform to a geometry of a second tissue surface and to provide an apposition force against the second tissue surface, andc) a defect-occupying member disposed between the first occluding member and the second occluding member and adapted to not provide substantial apposition force against tissue around the an aperture of the defect, anda sealing member in contact with the framewherein the frame is defined by a plurality of wound elongate members that each extends from a proximal end of

the frame to a distal end of the frame,wherein each elongate member includes:a first portion that defines a petal of the first occluding member;a second portion that defines a petal of the second occluding member; anda third portion, disposed between the first portion and the second portion, defining an inflection region of the defect occupying member.

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4. claims: 23-29

A medical device for sealing defects or structures in a heart, the medical device comprising:a wire frame that includes a plurality of wires that form a first occluding member and a second occluding member, the wire frame including a defect-occupying portion disposed between the first occluding member and the second occluding member,wherein the medical device can be manufactured in a plurality of distinct sizes, and wherein a range of defect sizes from about 8 mm to about 35 mm can all be sealed using five or fewer distinct sizes of the medical device

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5. claims: 30-56

A medical device for sealing a defect or structure in a heart, the medical device comprising:a wire frame that includes a plurality of wires that form a first occluding member and a second occluding member, the wire frame including a defect-occupying portion disposed between the first occluding member and the second occluding member;wherein the defect-occupying portion is adapted to not significantly deform the defect, and wherein the defect-occupying portion is adapted to fill a range of defect sizes from 13 mm to 20 mm (for claims 30-32), resp. from 18mm to 25mm (for claims 33-35), resp. from 23mm to 30mm (for claims 36-38), resp. from 28mm to 35mm (for claims 39-41), resp. from 7mm to 35mm (for claims 42-44), resp. from 7mm to 30mm (for claims 45-47), resp. from 7mm to 25mm (for claims 48-50), resp. from 7mm to 20mm (for claims 51-53), resp. from 7mm to 15mm (for claims 54-56)

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6. claims: 57-66

medical device for sealing a defect or structure in a heart, the medical device comprising:a wire frame that includes a plurality of wires that form a first occluding member and a second occluding member, the wire frame including a defect-occupying portion disposed between the first occluding member and the second occluding member; having a nominal outer diameter, wherein the first and second occluding member maintain a generally flat profile when the defect-occupying portion deflects to an outer diameter that is less than about 60% of the nominal outer diameter of the defect-occupying portion.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 65-67

Claims 65-67 disclose a method of treatment by surgery practised on the human body contrary to Rule 39.1(iv) PCT.

Claims 65-67 pertain to a method for sealing a defect or structure in the heart comprising the step of advancing a delivery apparatus to a location of the defect or structure in the heart and deploying the medical device from the delivery apparatus obviously forming part of a surgical procedure. The Authority is therefore not required to carry out international search preliminary examination.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.