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kind of national protection available): AE, AG, AL, AM,
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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
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KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
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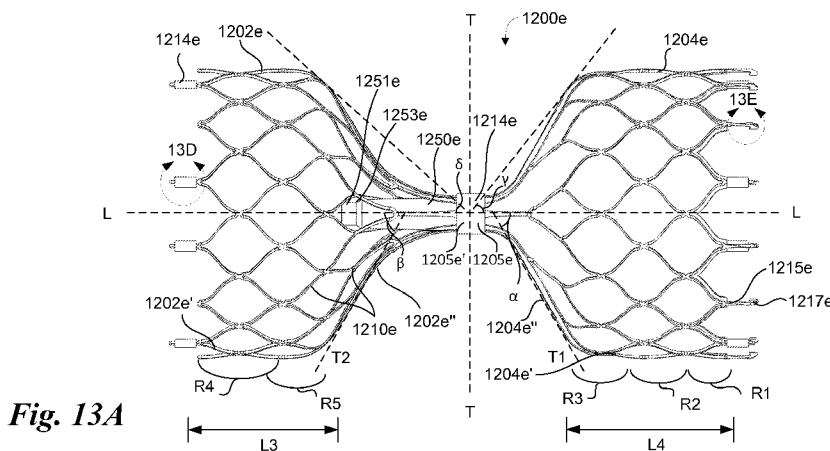


Fig. 13A

(57) Abstract: The present disclosure describes an occlusion device and methods of delivering the occlusion device. The occlusion device can include an expandable structure configured to move between an unexpanded configuration and an expanded configuration. The expandable structure can be configured to have an expansion ratio of at least about 5:1. Further, the occlusion device can be configured to prevent substantially all fluid from flowing past the occlusion device when the occlusion device is in the expanded configuration in the vessel. The device can include a valve which seals a guidewire lumen when the guidewire is not in place.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
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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 A61F 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 practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/018636 A1 (GAILLOUD PHILIPPE [US] ET AL) 15 January 2009 (2009-01-15) paragraphs [0048], [0050], [0053], [0059], [0062], [0067], [0073], [0076]; figures 2,4-5 -----	1-7, 33-39,87
X	WO 2009/124247 A2 (COOK WILLIAM EUROP [DK]; COOK INC [US]; HENDRIKSEN PER [DK]; CLAUSEN J) 8 October 2009 (2009-10-08) paragraphs [0046], [0061]; figure 6 -----	1-7, 33-39,87
X	US 2003/220667 A1 (VAN DER BURG ERIK J [US] ET AL) 27 November 2003 (2003-11-27) paragraphs [0059], [0061], [0076] - [0077], [0085] - [0087]; figures 6,24 ----- -/--	1-3,6,87

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 5 February 2015	Date of mailing of the international search report 06. 07. 2015
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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 Nice, Philip
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INTERNATIONAL SEARCH REPORT

International application No
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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,P	WO 2013/188226 A1 (COOK MEDICAL TECHNOLOGIES LLC [US]) 19 December 2013 (2013-12-19) abstract; figures 2,7-8 page 9, line 14 - line 32 page 10, line 28 - page 11, line 2 -----	1-3,6,7, 87
X,P	US 2014/207172 A1 (BODEWADT TUE THUREN [DK] ET AL) 24 July 2014 (2014-07-24) paragraphs [0045], [0063] - [0064], [0073] - [0074]; figure 5 -----	1-3,6,7, 87
A	WO 03/073961 A1 (SALVIAC LTD [IE]; KEEGAN MARTIN [IE]; BRADY EAMON [IE]; CASEY BRENDAN) 12 September 2003 (2003-09-12) page 64, line 14 - page 65, line 14 page 70, line 10 - page 71, line 22 -----	1
A	EP 1 479 409 A1 (KANEKA CORP [JP]) 24 November 2004 (2004-11-24) paragraph [0022] -----	1
A	WANG WEIPING ET AL: "The amplatzer vascular plug: a review of the device and its clinical applications.", CARDIOVASCULAR AND INTERVENTIONAL RADIOLOGY, vol. 35, no. 4, August 2012 (2012-08), pages 725-740, XP002735542, ISSN: 1432-086X, DOI: 10.1007/s00270-012-0387-z abstract; figure 1 -----	1,7,33, 87

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2014/002429

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.: 13-16, 65, 66
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
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 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.:
1-7, 33-39, 87

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: 1-7, 33-39, 87

Vascular occlusion device suitable for particular vessels

2. claims: 8-12

Vascular occlusion device with inner and outer catheters

3. claims: 17-32, 48-64

Vascular occlusion device with a porous membrane

4. claims: 40, 46

Vascular occlusion device with improved anchoring

5. claims: 41-43, 45

Vascular occlusion device adapted for particular catheters

6. claim: 44

Vascular occlusion device deployment system with trackability

7. claim: 47

Vascular occlusion device deployment system with contrast injection capability

8. claims: 67-71

Vascular occlusion device with a collapsible tube

9. claims: 72-86

Vascular occlusion device with a hinge

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2014/002429

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2009018636	A1	15-01-2009	US 2009018636 A1	15-01-2009
			US 2013053879 A1	28-02-2013

WO 2009124247	A2	08-10-2009	EP 2282684 A2	16-02-2011
			US 2011054512 A1	03-03-2011
			WO 2009124247 A2	08-10-2009

US 2003220667	A1	27-11-2003	US 7128073 B1	31-10-2006
			US 2003220667 A1	27-11-2003
			US 2004098031 A1	20-05-2004
			US 2005004652 A1	06-01-2005
			US 2005203568 A1	15-09-2005
			US 2007083227 A1	12-04-2007
			US 2011218566 A1	08-09-2011
			US 2012065662 A1	15-03-2012
			US 2013331884 A1	12-12-2013
			US 2014046360 A1	13-02-2014

WO 2013188226	A1	19-12-2013	GB 2503013 A	18-12-2013
			US 2013338699 A1	19-12-2013
			WO 2013188226 A1	19-12-2013

US 2014207172	A1	24-07-2014	GB 2509950 A	23-07-2014
			US 2014207172 A1	24-07-2014

WO 03073961	A1	12-09-2003	AT 369088 T	15-08-2007
			AT 378019 T	15-11-2007
			AU 2003209965 A1	16-09-2003
			AU 2003209966 A1	16-09-2003
			DE 60315425 T2	26-06-2008
			DE 60317474 T2	02-10-2008
			EP 1482860 A1	08-12-2004
			EP 1482861 A1	08-12-2004
			ES 2295608 T3	16-04-2008
			US 2003212429 A1	13-11-2003
			US 2007060946 A1	15-03-2007
			US 2007244504 A1	18-10-2007
			US 2014142609 A1	22-05-2014
			WO 03073961 A1	12-09-2003
			WO 03073962 A1	12-09-2003

EP 1479409	A1	24-11-2004	AU 2003211251 A1	22-09-2003
			CA 2474937 A1	18-09-2003
			CN 1630542 A	22-06-2005
			EP 1479409 A1	24-11-2004
			JP 4441159 B2	31-03-2010
			JP 2003250898 A	09-09-2003
			KR 20040079425 A	14-09-2004
			US 2004267196 A1	30-12-2004
			WO 03075996 A1	18-09-2003
