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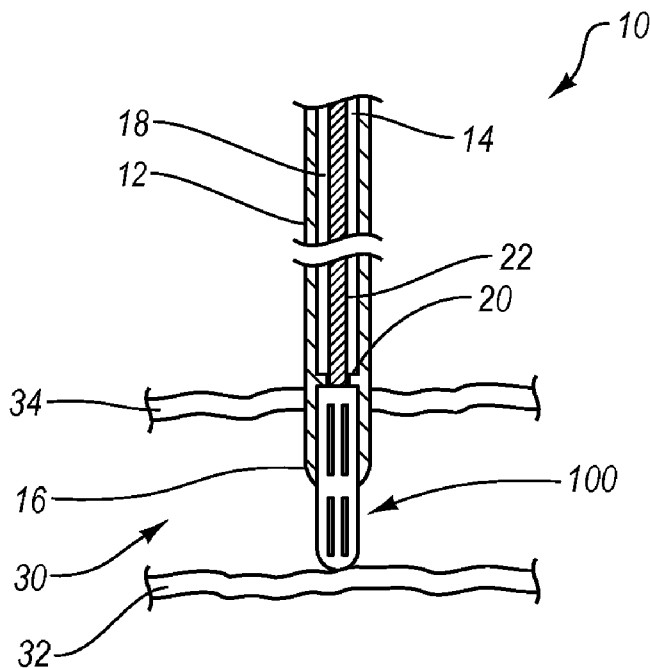
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[Continued on next page]

(54) Title: CLOSURE DEVICE



**Fig. 1**

(57) Abstract: A closure device (10) for closing an opening in tissue is provided. The closure device according to the present invention includes a delivery system for deploying a closure element (100, 300), wherein the closure element is movable between a delivery configuration and a deployed configuration to close an opening in tissue. The closure device of the present invention may further include a charge of hemostatic material (50).



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— 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))

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# INTERNATIONAL SEARCH REPORT

International application No  
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**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 practical, 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	WO 2008/074027 A1 (BIOMERIX CORP [US]; SEPETKA IVAN [US]; MIRIGIAN GREG [US]; DATTA ARIND) 19 June 2008 (2008-06-19) paragraphs [0010], [0015], [0030], [0084], [0101], [0117] - [0119], [0124], [0128], [0060], [0133], [0135], [0140], [0163] - paragraphs [0167], [0198] - [0210]; figures 8,9,10	1-16, 26-29, 33,39-42
X	US 5 853 422 A (HUEBSCH JOSEPH [US] ET AL) 29 December 1998 (1998-12-29)  columns 3,4; figures 2-4,6,14,16  ----- -/--	1-5, 8-14,16, 26-29, 33,39-41

Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents :

<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>	<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>
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Date of the actual completion of the international search  <b>27 May 2010</b>	Date of mailing of the international search report  <b>10/06/2010</b>
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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  <b>Assion, Jean-Charles</b>
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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	WO 2005/006990 A2 (NMT MEDICAL INC [US]; CHANDUSZKO ANDRZEJ J [US]) 27 January 2005 (2005-01-27)  figures 2A,2B,4A,7A,9G,11A,11B,12A -----	1-5, 8-16, 26-29, 33-41,43
X	EP 1 867 287 A2 (EV3 ENDOVASCULAR INC [US]) 19 December 2007 (2007-12-19)	1-5,8-14
A	paragraphs [0081], [0129] - paragraph [0144]; figures 2,19c,20,22A -----	26,34,43
X	WO 2007/088069 A1 (COLEMAN JAMES E [IE]; CUMMINS CHRISTY [IE]) 9 August 2007 (2007-08-09) columns 41-43; figures 1A,1D,4A,8A -----	1-3,5, 8-16
X	WO 2005/110240 A1 (NMT MEDICAL INC [US]; CHANDUSZKO ANDRZEJ J [US]; WIDOMSKI DAVID R [US]) 24 November 2005 (2005-11-24)	26-31, 33-43
A	figures 2f,5,16,20,27,28,30,31,58,59 -----	3,4
A	US 2007/265658 A1 (NELSON DALE [US] ET AL) 15 November 2007 (2007-11-15) figure 8 -----	4
A	US 2006/100664 A1 (PAI SURESH S [US] ET AL) 11 May 2006 (2006-05-11) figures 2B,5C,5F -----	6,7,32
A	WO 2004/012602 A2 (ABBOTT LAB VASCULAR ENTPR LTD [IE]; MICHLITSCH KENNETH J [US]) 12 February 2004 (2004-02-12) paragraph [0047]; figures 4B,4C,13 -----	6,7,32
X	WO 2008/036384 A2 (SYNECOR LLC [US]; WILLIAMS MICHAEL S [US]; ORTH GEOFFREY A [US]; GLENN) 27 March 2008 (2008-03-27) figures 1D,1E,6A,8A,8B,22B,24A,25A,25B -----	26-31, 33-43
X	WO 99/40849 A1 (JUMP JEFFREY [CH]; TEVAEARAI HENDRIK [CH]) 19 August 1999 (1999-08-19) figures 4,6 -----	26-31, 33,39-42
X	US 2003/055455 A1 (YANG DACHUAN [US] ET AL) 20 March 2003 (2003-03-20) paragraphs [0037], [0045]; figures 5,10 -----	26-31, 33,39-42
X	US 2007/179527 A1 (ESKURI ALAN [US] ET AL) 2 August 2007 (2007-08-02) figure 2A -----	26-31, 33,39-42

# INTERNATIONAL SEARCH REPORT

International application No.  
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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.: 18-22, 44-47  
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  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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.:  
1-16, 26-43
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-5, 8-16

device having slits  
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2. claims: 6, 7, 32

hemostatic material delivery device  
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3. claim: 17

tubular member having an indentation  
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4. claims: 23-25

handle assembly  
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5. claims: 26-31, 33-43

device having flanges and a coupler  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2009/062789
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008074027 A1	19-06-2008	US 2008281350 A1	13-11-2008
US 5853422 A	29-12-1998	US 6024756 A US 6117159 A US 6312446 B1	15-02-2000 12-09-2000 06-11-2001
WO 2005006990 A2	27-01-2005	CA 2532112 A1 EP 1651116 A2 JP 2007523686 T	27-01-2005 03-05-2006 23-08-2007
EP 1867287 A2	19-12-2007	NONE	
WO 2007088069 A1	09-08-2007	AU 2007211551 A1 CA 2640480 A1 CN 101410063 A EP 1983902 A1 JP 2009525092 T KR 20080110741 A US 2007185529 A1 US 2010004681 A1 ZA 200810282 A	09-08-2007 09-08-2007 15-04-2009 29-10-2008 09-07-2009 19-12-2008 09-08-2007 07-01-2010 27-01-2010
WO 2005110240 A1	24-11-2005	CA 2563298 A1 EP 1748732 A1 JP 2007535997 T US 2005273135 A1	24-11-2005 07-02-2007 13-12-2007 08-12-2005
US 2007265658 A1	15-11-2007	WO 2007133254 A2	22-11-2007
US 2006100664 A1	11-05-2006	CA 2583238 A1 EP 1807131 A1 JP 2008518743 T WO 2006052612 A1	18-05-2006 18-07-2007 05-06-2008 18-05-2006
WO 2004012602 A2	12-02-2004	AU 2003253330 A1 CA 2492703 A1 EP 1526811 A2 JP 2005534388 T US 2006155330 A1	23-02-2004 12-02-2004 04-05-2005 17-11-2005 13-07-2006
WO 2008036384 A2	27-03-2008	EP 2079370 A2 JP 2010504154 T US 2008215089 A1	22-07-2009 12-02-2010 04-09-2008
WO 9940849 A1	19-08-1999	AU 2261799 A CH 693017 A5	30-08-1999 31-01-2003
WO 9940849 A1		EP 1054628 A1	29-11-2000
US 2003055455 A1	20-03-2003	WO 03024337 A1	27-03-2003
US 2007179527 A1	02-08-2007	WO 2007092274 A1	16-08-2007