



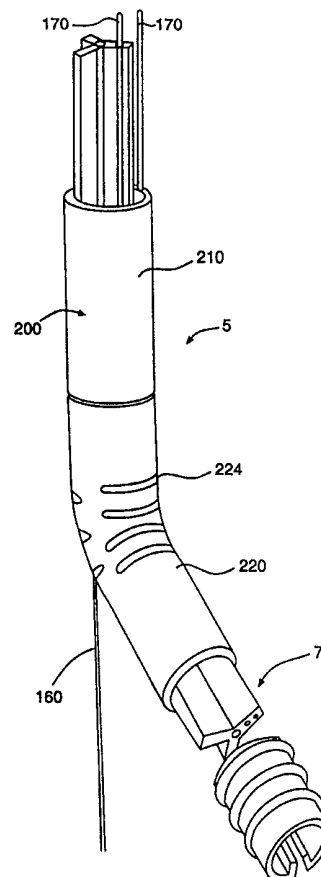
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : A61B 8/12, A61F 2/06, A61M 25/00, 29/00</p>	<p>A3</p>	<p>(11) International Publication Number: WO 99/00055 (43) International Publication Date: 7 January 1999 (07.01.99)</p>
<p>(21) International Application Number: PCT/US98/13115 (22) International Filing Date: 29 June 1998 (29.06.98) (30) Priority Data: 60/051,209 30 June 1997 (30.06.97) US 08/896,415 18 July 1997 (18.07.97) US 08/958,524 27 October 1997 (27.10.97) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Applications US 60/051,209 (CIP) Filed on 30 June 1997 (30.06.97) US 08/896,415 (CIP) Filed on 18 July 1997 (18.07.97) US 08/958,524 (CIP) Filed on 27 October 1997 (27.10.97) (71) Applicant (for all designated States except US): EVA CORPORATION [US/US]; Hugh, Trout, M., D., III, 8218 Wisconsin Avenue #204, Bethesda, MD 20814 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): TANNER, Howard [GB/US]; 242 East 100 South, Logan, UT 84321 (US).</p>	<p>TROUT, Hugh, III [US/US]; 8218 Wisconsin Avenue #204, Bethesda, MD 20814 (US). EHMSEN, Ronald [US/US]; 10551 Wulff Drive, Villa Park, CA 92861 (US). (74) Agent: COYNE, Patrick, J.; Collier, Shannon, Rill & Scott, PLLC, Suite 400, 3050 K Street, N.W., Washington, DC 20007 (US). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 18 March 1999 (18.03.99)</p>	

(54) Title: METHOD AND APPARATUS FOR THE SURGICAL REPAIR OF ANEURYSMS

(57) Abstract

An attachment assembly, and repair graft are disclosed for securing a graft (3) to repair a vessel (1) having an aneurysm therein. The attachment assembly comprises an attachment cuff (12) such that the graft is not dimensionally dependent upon the size of the vessel. A visualization apparatus (6) is also disclosed for real time direct viewing of an interior of a vessel. A penetration apparatus (7) is disclosed for use in forming treatment specific holes in a potentially calcified vessel wall which facilitates thereafter the securing of the graft, and attachment assembly to the vessel wall. An introducer sheath device (900) is also disclosed that comprises a sealing assembly (930) for preventing the loss of blood from the vessel during the insertion, and subsequent removal of surgical components during the surgical procedure.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/13115

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A61B 8/12; A61F 2/06; A61M 25/00, 29/00
US CL :128/662.06; 606/40, 41, 194-198; 623/1, 12
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. : 128/662.06; 606/40, 41, 194-198; 623/1, 12

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 Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,676,696 A (MARCADE) 14 October 1997, Figs. 1 and 2.	1-18, 90-92
X	US 5,606,975 A (LIANG et al) 04 March 1997, entire document.	18-29, 48-59
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A		30-47, 60-74
X	US 5,389,098 A (TSURUTA et al) 14 February 1995, Figs. 22, 23, 24A, 26A, and 28B.	75-81, 96-113
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A		95, 114-116
X	US 5,505,698 A (BOOTH et al) 9 April 1996, entire document.	82-89

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

* Special categories of cited documents:	*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
A document defining the general state of the art which is not considered to be of particular relevance	*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
E earlier document published on or after the international filing date	*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
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)	*A* document member of the same patent family
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	

Date of the actual completion of the international search
23 NOVEMBER 1998

Date of mailing of the international search report
18 DEC 1998

Name and mailing address of the ISA/US
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B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

APS

Search Terms: fastener, legs, wire, vessel, blood, catheter, inflatable cuff, fluid, sealing cavity, surgical, passage, ultrasound, visualize, saline, laser, ablate

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

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

Group I, claims 1-18, drawn to a repair graft assembly comprising an attachment assembly.

Group II, claims 19-74, drawn to a repair apparatus assembly comprising a penetration apparatus and visualization apparatus.

Group III, claims 75-81 and 96-116, drawn to a surgical fastener.

Group IV, claims 82-89, drawn to an introducer sheath device.

Group V, claims 90-95, drawn to a method of repairing an aneurysm.

Groups I-V, the inventions listed as these groups do not relate to a single 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:

Groups I-IV are separate and distinct inventions. No group requires the particulars of any other inventions of the other groups.

Group V, this group does not require the particulars of the inventions of Groups I-IV. That is, the inventions of Groups I-IV can be practiced in a materially different manner than the method described in this group.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/13115

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra 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 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.
 No protest accompanied the payment of additional search fees.