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(57) Abstract: Guide wire devices and other intra-corporal medical devices fabricated from a Ni-Ti-Nb alloy and methods for their manufacture. The Ni-Ti alloy includes nickel, titanium, and niobium either up to its solubility limit in Ni-Ti, or in amounts over 15 atomic percent so as to provide a dual phase alloy. In either case, the Ni-Ti-Nb alloy provides increased stiffness to provide better torque response, steerability, stent scaffolding strength, and similar properties associated with increased stiffness, while still providing super-elastic or linear pseudo-elastic properties.



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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/068054 A1 (OZAWA MICHIHIDE [JP] ET AL) 12 March 2009 (2009-03-12) paragraphs [0009], [0024], [0025], [0026], [0027], [0028], [0044] -----	1-19
X	EP 0 873 734 A2 (NITINOL DEV CORP [US]) 28 October 1998 (1998-10-28) column 1, line 50 - column 3, line 10; claims -----	1-19
X	WO 95/27092 A1 (BESSELINK PETRUS A [NL]; SACHDEVA ROHIT C L [US]) 12 October 1995 (1995-10-12) page 5, line 11 - page 6, line 12; claims ----- -/-	1-7
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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	US 2010/125329 A1 (LIN ZHI CHENG [US] ET AL) 20 May 2010 (2010-05-20) paragraphs [0012], [0014], [0015], [0030], [0040]; claims -----	8,10,16, 17
A	PIAO M ET AL: "EFFECTS OF NB ADDITION ON THE MICROSTRUCTURE OF TI-NI ALLOYS", MATERIALS TRANSACTIONS. JIM, SENDAI, JP, vol. 33, no. 4, 1 January 1992 (1992-01-01), pages 337-345, XP002072269, ISSN: 0916-1821 the whole document -----	1-19

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009068054	A1	12-03-2009	JP 4737518 B2 03-08-2011
			JP 2006328436 A 07-12-2006
			US 2009068054 A1 12-03-2009
			WO 2006126515 A1 30-11-2006
EP 0873734	A2	28-10-1998	CA 2235783 A1 25-10-1998
			DE 69819063 D1 27-11-2003
			DE 69819063 T2 08-07-2004
			EP 0873734 A2 28-10-1998
			JP 4248618 B2 02-04-2009
			JP H1142283 A 16-02-1999
			US 2001007953 A1 12-07-2001
WO 9527092	A1	12-10-1995	EP 0753080 A1 15-01-1997
			JP H09511281 A 11-11-1997
			US 6428634 B1 06-08-2002
			WO 9527092 A1 12-10-1995
US 2010125329	A1	20-05-2010	NONE