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(54) Simo ductile iron castings for gas turbine applications

(57) A cast article of a ductile iron wherein the ductile iron includes carbon from about 2.8 to 3.7 weight percent, silicon from about 3.0 to 3.5 weight percent, molybdenum from 0.8 to 1.5 weight percent, magnesium from about 0.025 to 0.60 weight percent, sulfur less than 0.01 weight percent and nickel from about 0.0 to 1.3 weight percent, the remaining content being iron is provided. The cast article is suitable for a gas turbine casing. A method of manufacturing a cast article is also provided.

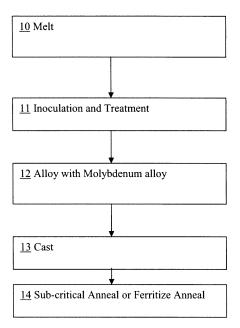


FIG. 1



EUROPEAN SEARCH REPORT

Application Number EP 10 16 5664

	DOCUMENTS CONSIDE	RED TO BE RELEVANT				
Category	Citation of document with in of relevant passa		Relevant to claim			
X,D A	22 November 2006 (2	TACHI METALS LTD [JP]) 906-11-22) - paragraph [0135] *	1-3 4-15	INV. C22C33/08 C22C37/10 C21D5/00 C21D1/32		
X A	EP 1 808 504 A1 (SI 18 July 2007 (2007- * claims 1, 13, 16-	97-18)	1-6 7-15	32101/32		
Х	JP 7 118790 A (JAPA 9 May 1995 (1995-05 * the whole documen	-09)	1-15			
Χ	JP 2000 303135 A (K 31 October 2000 (20 * the whole documen	90-10-31)	1-3,5			
A A	US 2009/123321 A1 (11 May 2009 (2009-0	 SHIN HO CHUL [KR])	1-15			
	* claim 1 * `	- paragraph [0056] *		TECHNICAL FIELDS SEARCHED (IPC)		
Α	JP 2002 371335 A (A 26 December 2002 (20 * the whole documen	002-12-26)	1-15	C21D		
A	KG [DE]) 8 September	EPPER AUGUST GMBH & CO r 1988 (1988-09-08) - column 4, line 35 *	1-15			
А	EP 0 076 701 A2 (NI 13 April 1983 (1983 * claims 1-4 * * examples 1-2 *		1-15			
	The present search report has b	-/	-			
	Place of search	Date of completion of the search		Examiner		
The Hague		28 March 2012	Vla	Vlassi, Eleni		
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background		E : earlier patent do after the filing dat er D : document cited i L : document cited fo	T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons			
O : non-written disclosure P : intermediate document		& : member of the sa document	 member of the same patent family, corresponding document 			



EUROPEAN SEARCH REPORT

Application Number EP 10 16 5664

Category	Citation of document with indication of relevant passages	on, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	WO 99/19525 A1 (CAMCAS COOPER SELWYN JAMES [AI 22 April 1999 (1999-04 * claims 1-35 * * examples 1-3 *	J])	1-15		
				TECHNICAL FIELDS SEARCHED (IPC)	
	The present search report has been of Place of search	Date of completion of the search		Examiner	
	The Hague	28 March 2012	Vla	ssi, Eleni	
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		E : earlier patent do after the filing dat D : document cited i L : document cited fo & : member of the sc	T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filling date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document		

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 10 16 5664

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-03-2012

Patent document cited in search repor	t	Publication date		Patent family member(s)		Publication date
EP 1724370	A1	22-11-2006	AT CN EP JP KR US WO	456684 1926255 1724370 4858704 20060125896 2008308193 2005085488	A A1 B2 A A1	15-02-20 07-03-20 22-11-20 18-01-20 06-12-20 18-12-20 15-09-20
EP 1808504	A1	18-07-2007	CN EP EP US WO	101400812 1808504 1974068 2010178192 2007082788	A1 A1 A1	01-04-20 18-07-20 01-10-20 15-07-20 26-07-20
JP 7118790	Α	09-05-1995	JP JP	3597211 7118790		02-12-20 09-05-19
JP 2000303135	5 A	31-10-2000	JP JP	3582400 2000303135	Α	27-10-20 31-10-20
US 2009123321	L A1	14-05-2009	KR US	20090048024 2009123321	Α	13-05-20 14-05-20
JP 2002371335	5 A	26-12-2002	NON	E		
DE 3706516	A1	08-09-1988	NON	E		
EP 0076701	A2	13-04-1983	DE EP JP JP JP	3271179 0076701 1343268 58058248 60053736	A2 C A	19-06-19 13-04-19 29-10-19 06-04-19 27-11-19
WO 9919525	A1	22-04-1999	AT BR CA DE EP JP NZ PL RU WO	331820 9814608 2305902 69835099 1029098 2001520313 504014 339902 2216604 9919525	A A1 T2 A1 A A A1 C2	15-07-20 03-10-20 22-04-19 01-02-20 23-08-20 30-10-20 31-01-20 20-11-20

FORM P0459

 $\stackrel{\text{O}}{\text{ii}}$ For more details about this annex : see Official Journal of the European Patent Office, No. 12/82