



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
18.01.2012 Bulletin 2012/03

(51) Int Cl.:
B22C 7/02 (2006.01) **B22C 9/04** (2006.01)
B22C 9/24 (2006.01)

(43) Date of publication A2:
04.05.2011 Bulletin 2011/18

(21) Application number: **10188114.2**

(22) Date of filing: **19.10.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(71) Applicant: **Howmet Corporation**
Whitehall, MI 49461-1895 (US)

(72) Inventor: **Grunstra, Robert E.**
Spring Lake, MI 49456 (US)

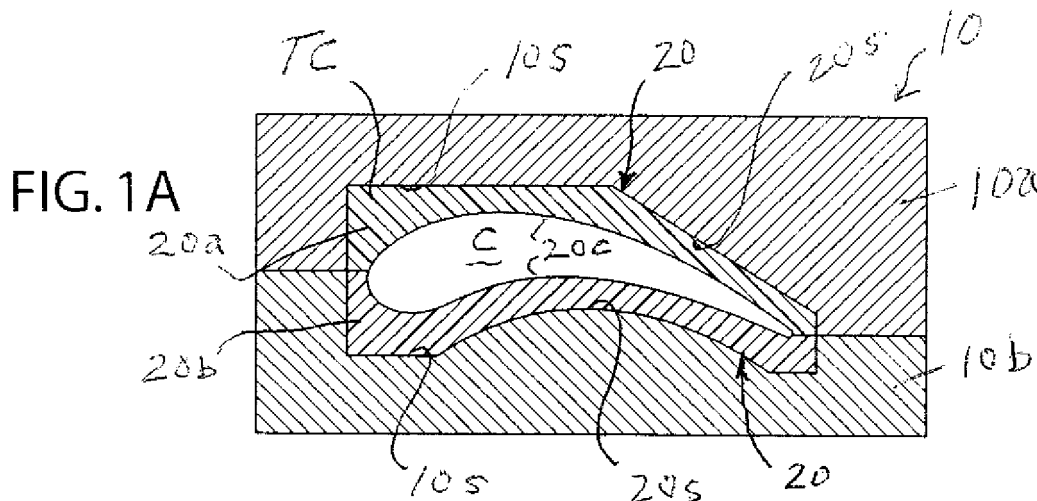
(74) Representative: **Hoeger, Stellrecht & Partner**
Patentanwälte
Uhlandstrasse 14c
70182 Stuttgart (DE)

(30) Priority: **28.10.2009 US 589801**

(54) **Fugitive core tooling and method**

(57) A ceramic core is produced by introducing a fluid ceramic core material, such as a ceramic slurry, into a core-shaped cavity formed at least in part by one or more fugitive core tooling liners residing in a back-up body, removing the ceramic core from the cavity, and removing the one or more fugitive tooling liners from the back-up

die body and discarding them. The fugitive tooling liners and optional tooling inserts are used in one or more production cycles (e.g. ceramic slurry injection cycle) to make a single or multiple ceramic cores and then replaced with fresh (un-used) tooling liners and optional inserts to make other ceramic cores.





EUROPEAN SEARCH REPORT

Application Number
EP 10 18 8114

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2008/000611 A1 (BUNKER RONALD SCOTT [US] ET AL) 3 January 2008 (2008-01-03) * paragraphs [0024] - [0027]; figures 3-4 * * claims 1-25; figures 1-10 *	1-15	INV. B22C7/02 B22C9/04 B22C9/24
A	EP 1 611 978 A1 (UNITED TECHNOLOGIES CORP [US]) 4 January 2006 (2006-01-04) * paragraphs [0004] - [0005] * * sentences 23-33, paragraph 19; figure 2 *	1-15	
A	& EP 1 616 642 A1 (UNITED TECHNOLOGIES CORP [US]) 18 January 2006 (2006-01-18) -----	1-15	
A	EP 1 769 862 A1 (UNITED TECHNOLOGIES CORP [US]) 4 April 2007 (2007-04-04) * paragraph [Summary.of.the.Invention] * * figures 1-2 *	1-15	
A	EP 1 125 702 A2 (HOWMET RES CORP [US]) 22 August 2001 (2001-08-22) * paragraph [0007]; figures 1-4 *	1-15	TECHNICAL FIELDS SEARCHED (IPC)
A,D	US 5 295 530 A (O'CONNOR KURT F [US] ET AL) 22 March 1994 (1994-03-22) * paragraph [Summary.of.the.invention]; figures 1-13 * & US 5 545 003 A (O'CONNOR KURT F [US] ET AL) 13 August 1996 (1996-08-13) -----	1-15	B22C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 December 2011	Examiner Lombois, Thierry
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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 & : member of the same patent family, corresponding document</p>			

1

EPO FORM 1503 03.82 (P04C01)

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

EP 10 18 8114

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.

09-12-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2008000611	A1	03-01-2008	CN 101096048 A	02-01-2008
			DE 102007030096 A1	03-01-2008
			JP 2008006502 A	17-01-2008
			US 2008000611 A1	03-01-2008

EP 1611978	A1	04-01-2006	AT 413937 T	15-11-2008
			AU 2005201580 A1	05-01-2006
			EP 1611978 A1	04-01-2006
			KR 20060045990 A	17-05-2006
			US 2005274478 A1	15-12-2005
			ZA 200503068 A	25-04-2007

EP 1769862	A1	04-04-2007	CN 1943909 A	11-04-2007
			EP 1769862 A1	04-04-2007
			JP 2007098476 A	19-04-2007
			SG 131010 A1	26-04-2007
			US 2007074839 A1	05-04-2007

EP 1125702	A2	22-08-2001	EP 1125702 A2	22-08-2001
			JP 2001287228 A	16-10-2001
			US 6533986 B1	18-03-2003

US 5295530	A	22-03-1994	CA 2077222 A1	19-08-1993
			DE 69322300 D1	14-01-1999
			DE 69322300 T2	26-08-1999
			DE 69324939 D1	17-06-1999
			DE 69324939 T2	11-11-1999
			DE 69330212 D1	13-06-2001
			DE 69330212 T2	20-09-2001
			EP 0559251 A1	08-09-1993
			JP 2838081 B2	16-12-1998
			JP 6055256 A	01-03-1994
			JP 10029053 A	03-02-1998
			US 5295530 A	22-03-1994
			US 5545003 A	13-08-1996

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82