



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**05.09.2001 Bulletin 2001/36**

(51) Int Cl.7: **C22C 19/05, C30B 11/00,  
C30B 29/52**

(43) Date of publication A2:  
**29.08.2001 Bulletin 2001/35**

(21) Application number: **95116194.2**

(22) Date of filing: **13.10.1995**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB IT LI LU NL SE**

(72) Inventor: **Erickson, Gary L.  
Muskegon, Michigan 49442 (US)**

(71) Applicant: **CANNON-MUSKEGON  
CORPORATION  
Muskegon, Michigan 49441 (US)**

(74) Representative: **Grünecker, Kinkeldey,  
Stockmair & Schwanhäusser Anwaltssozietät  
Maximilianstrasse 58  
80538 München (DE)**

(54) **Hot corrosion resistant single crystal nickel-based superalloys**

(57) This invention relates to a hot corrosion resistant nickel-based superalloy comprising the following elements in percent by weight: from about 14.2 to about 15.5 percent chromium, from about 2.0 to about 4.0 percent cobalt, from about 0.30 to about 0.45 percent molybdenum, from about 4.0 to about 5.0 percent tungsten, from about 4.5 to about 5.8 percent tantalum, from about 0.05 to about 0.25 percent columbium, from about 3.2

to about 3.6 percent aluminum, from about 4.0 to about 4.4 percent titanium, from about 0.01 to about 0.06 percent hafnium, and the balance nickel plus incidental impurities, the superalloy having a phasal stability number  $N_{V3B}$  less than about 2.45. Single crystal articles can be suitably made from the superalloy of this invention. The article can be a component for a gas turbine engine and, more particularly, the component can be a gas turbine blade or gas turbine vane.

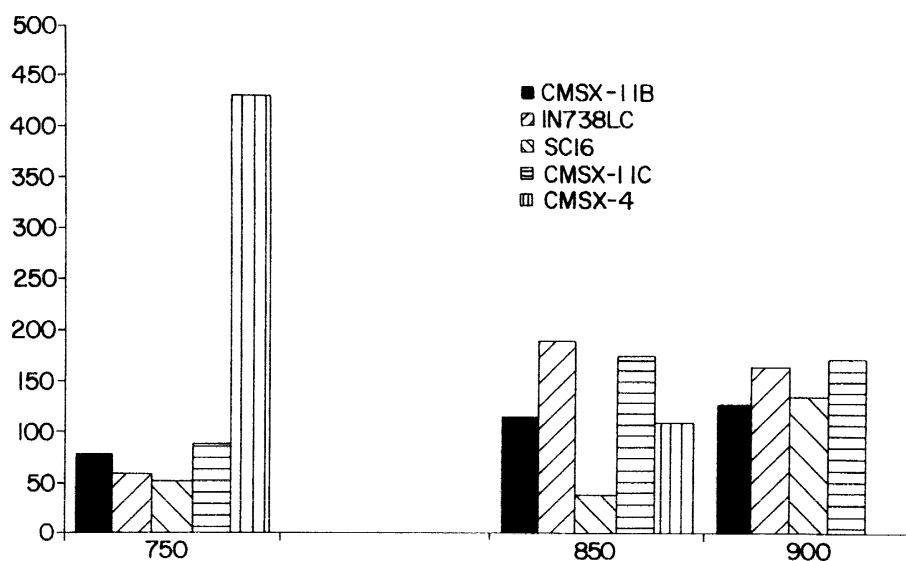


FIG. 1



European Patent Office

EUROPEAN SEARCH REPORT

Application Number  
EP 95 11 6194

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 207 874 (UNITED TECHNOLOGIES CORP) 7 January 1987 * claim 1 *	1,11,19	C22C19/05 C30B11/00 C30B29/52
	---		
D,A	US-A-4 677 035 (FIEDLER LOUIS J ET AL) 30 June 1987 * claim 1 *	1,11,19	
	---		
D,A	GB-A-2 153 848 (UNITED TECHNOLOGIES CORP) 29 August 1985 * claims 1,2 *	1,11,19	
	---		
A	EP-A-0 240 451 (UNITED TECHNOLOGIES CORP) 7 October 1987 * claims 1,2 *	1,11,19	
	---		
A	EP-A-0 577 316 (CANNON MUSKEGON CORP) 5 January 1994 * claim 1 *	1,11,19	
	-----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			C22C C30B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 February 1996	Examiner Gregg, N
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1501 01.92 (P04C01)

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

EP 95 11 6194

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.

12-02-1996

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-0207874	07-01-87	CA-A- 1296587	03-03-92
		DE-A- 3683091	06-02-92
		JP-A- 62030037	09-02-87
US-A-4677035	30-06-87	CA-A- 1249455	31-01-89
		EP-A, B 0187444	16-07-86
		JP-A- 61136649	24-06-86
		US-A- 5077141	31-12-91
GB-A-2153848	29-08-85	NONE	
EP-A-0240451	07-10-87	AU-B- 596403	03-05-90
		AU-B- 7070387	08-10-87
		CA-A- 1291350	29-10-91
		JP-A- 62235450	15-10-87
		US-A- 4915907	10-04-90
EP-A-0577316	05-01-94	US-A- 5366695	22-11-94
		AU-B- 4138393	06-01-94
		CA-A- 2099358	30-12-93
		CA-A- 2138672	06-01-94
		JP-A- 7138683	30-05-95
		WO-A- 9400611	06-01-94
		ZA-A- 9304378	13-01-94

EPO FORM P0459

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