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ory alloy has an altered geometry at a predetermined temperature. The actuator body 201 is also capable of operation in and is resistant to high temperature oxidizing atmospheres. A method for forming an actuator and a method for high temperature control are also disclosed.





EUROPEAN SEARCH REPORT

Application Number
EP 09 25 0494

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* paragraph [0008] - paragraph [0017]; claims 1-8; figures 1,2 *	10	C22F1/00 C22F1/10 F01D17/14
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 October 2010	Examiner Lilimpakis, Emmanuel
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 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			

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EPO FORM 1503 03.82 (P04C01)



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Application Number
EP 09 25 0494

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
Y	FONDA R W ET AL: "The shape memory effect in equiatomic TaRu and NbRu alloys" SCRIPTA MATERIALIA, ELSEVIER, AMSTERDAM, NL LNKD- DOI:10.1016/S1359-6462(98)00303-0, vol. 39, no. 8, 15 September 1998 (1998-09-15), pages 1031-1037, XP004325433 ISSN: 1359-6462 * the whole document *	10		
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The present search report has been drawn up for all claims				
Place of search Munich		Date of completion of the search 6 October 2010	Examiner Lilimpakis, Emmanuel	
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 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				

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EPO FORM 1503 03.82 (P04C01)



Application Number

EP 09 25 0494

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 09 25 0494

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-5, 11-15

A high temperature gas turbine engine component comprising an actuator body, with an actuatable portion comprising a shape memory alloy containing one more elements selected from the group consisting of Ni, Al, Nb, Ti, Ta and combinations thereof and a PGM metal selected from the group consisting of Pt, Pd, Rh, Ru, Ir and combinations thereof, the shape memory alloy having an altered geometry above a predetermined temperature; and wherein the actuator is resistant to high temperature oxidizing atmospheres.

2. claims: 6-9

The turbine engine component of any preceding claim, wherein the shape memory alloy has a specific formula $(A(1-x)PGM(x))^{0.5+y}B^{0.5-y}$ and : A is an element of Ni, Co, Fe and combination thereof; B is an element of Al, Cr, Hf, Zr, La, Y, Ce, Ti, Mo, W, Nb, Re, Ta and V, and combinations thereof; PGM is a platinum-group element from the group of Pt, Pd, Ru, Rh, Ir and combinations thereof, x is from greater than 0 to about 1 and y is from about -0.1 to about 0.23.

3. claim: 10

The turbine engine component of any preceding claim, wherein the shape memory alloy comprises an alloy of the formula $Ru^{0.5+y}(Nb^{1-x}Ta^x)^{0.5-y}$: wherein x is from about 0 to about 1, and y is from about -0.06 to about 0.23.

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

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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
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06-10-2010

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