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(54) High temperature shape memory alloy actuators

(57) A high temperature component having an actuator body 201 including an actuatable portion comprising a shape memory alloy containing one more of Ni, Al, Nb, Ti and Ta and a platinum-group metal. The shape mem-

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.

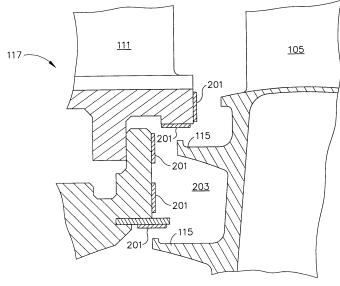


FIG. 2



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Application Number

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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

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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+yB0.5-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 Ru0.5+y(Nb1-xTax)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.

EP 09 25 0494

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.

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