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(54) **Heat treatment of nickel-base superalloy die inserts**

(57) A rigid die insert for forming and shaping a working material comprises a nickel-base superalloy, preferably Rene 95. A plurality of gamma prime particles are uniformly distributed throughout the rigid die insert, which has a Rockwell hardness Rc of between about 48 and about 52. The invention also includes a method of treating a rigid die insert comprising a nickel-base superalloy to reduce crack propagation and raise yield stress. The method comprises the steps of: providing the rigid die insert; dissolving larger gamma-prime par-

ticles in the rigid die insert; and growing additional gamma-prime particles of smaller particle size in the rigid die insert, whereby the particle size of each of the plurality of gamma-prime particles is refined, thereby reducing crack propagation and raising the yield stress of the rigid die insert. A method of refining the particle size of gamma-prime particles in a Rene 95 superalloy is also disclosed.

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# EUROPEAN SEARCH REPORT

Application Number  
EP 01 30 5605

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                  |                                                             |                                                                     |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                  |                                                             |                                                                     |
| Place of search<br><b>MUNICH</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                  | Date of completion of the search<br><b>15 November 2001</b> | Examiner<br><b>Badcock, G</b>                                       |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                  |                                                             |                                                                     |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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