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| <b>(51) International Patent Classification <sup>6</sup> :</b><br><b>B23K 26/08</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>A1</b> | <b>(11) International Publication Number:</b> <b>WO 99/36221</b><br><b>(43) International Publication Date:</b> 22 July 1999 (22.07.99)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>(21) International Application Number:</b> PCT/US98/23364<br><b>(22) International Filing Date:</b> 3 November 1998 (03.11.98)<br><b>(30) Priority Data:</b><br>09/008,092 16 January 1998 (16.01.98) US<br><b>(71) Applicant:</b> CHROMALLOY GAS TURBINE CORPORATION [US/US]; 330 Blaisdell Road, Orangeburg, NY 10962 (US).<br><b>(72) Inventors:</b> EMER, George; 99 Union Avenue, Cresskill, NJ 07626 (US). EDLUND, Dwight; 6 Couati Court, Stony Point, NY 10980 (US). VANASSE, Steve; 9 Mercury Court, Carmel, NY 10512 (US). DIZZINE, Michael, L.; 189 North Midland Avenue, Nyack, NY 10960 (US).<br><b>(74) Agent:</b> BITTMAN, Mitchell, D.; Sequa Corporation, 3 University Plaza, Hackensack, NJ 07601 (US). |           | <b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).<br><br><b>Published</b><br><i>With international search report.</i> |
| <b>(54) Title:</b> COMBINED PERCUSSION AND TREPAN LASER DRILLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>(57) Abstract</b><br><br>A process is provided for laser drilling relatively large and deep holes in superalloy components by percussion laser drilling a central hole through the component to a diameter less than the predetermined diameter, then trepanning laser drilling around the central hole to expand the diameter of the hole to the predetermined diameter.                                                                                                                                                                                                                                                                                                                                                 |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

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