

Title (en)

Method and device for building up residual stress in a metal workpiece

Title (de)

Verfahren und Vorrichtung zum Aufbau von Eigenspannungen in einem metallischen Werkstück

Title (fr)

Procédé et dispositif destinés au montage de contraintes résiduelles dans une pièce usinée métallique

Publication

EP 2065477 A1 20090603 (DE)

Application

EP 08019597 A 20081110

Priority

DE 102007056502 A 20071122

Abstract (en)

The method involves applying low energy laser pulse to a treatment site of workpiece (40) covered by a surface layer. A high energy laser pulse is applied to the treatment site after applying low energy laser pulse. A covering layer is provided over the treatment site during the application of the laser pulses. An independent claim is included for system for creating internal stress in metallic workpiece.

Abstract (de)

Ein Verfahren zum Aufbau von Eigenspannung in einem metallischen Werkstück durch Laser Shock Peening enthält die Schritte: - Aufbringen eines ersten Laserpulses an einem Behandlungsort des mit einer Oberflächenschicht bedeckten Werkstücks; - Aufbringen eines zweiten Laserpulses an den Behandlungsort des Werkstücks, wobei der zweite Laserpuls zeitlich auf den ersten Laserpuls folgt; und - Vorsehen einer Deckschicht über dem Behandlungsort während des Aufbringens der Laserpulse.

IPC 8 full level

C21D 10/00 (2006.01)

CPC (source: EP US)

C21D 10/005 (2013.01 - EP US)

Citation (search report)

- [X] US 5911891 A 19990615 - DULANEY JEFF L [US], et al
- [X] US 5131957 A 19920721 - EPSTEIN HAROLD M [US], et al
- [X] EP 1188842 A1 20020320 - GEN ELECTRIC [US]
- [X] EP 0933438 A1 19990804 - GEN ELECTRIC [US]
- [X] US 2004224179 A1 20041111 - SOKOL DAVID W [US], et al
- [A] EP 1669466 A1 20060614 - GEN ELECTRIC [US]
- [A] EP 1852515 A1 20071107 - GEN ELECTRIC [US]
- [X] SMITH P R ET AL: "EFFECT OF POWER DENSITY AND PULSE REPETITION ON LASER SHOCK PEENING OF 6AL-4V", JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE, ASM INTERNATIONAL, MATERIALS PARK, OH, US, vol. 9, no. 1, 1 February 2000 (2000-02-01), pages 33 - 37, XP000906621, ISSN: 1059-9495
- [X] DING K ET AL: "Simulation of multiple laser shock peening of a 35CD4 steel alloy", JOURNAL OF MATERIALS PROCESSING TECHNOLOGY, NL, vol. 178, no. 1-3, 14 September 2006 (2006-09-14), pages 162 - 169, XP025080710, ISSN: 0924-0136, [retrieved on 20060914]
- [X] FOURNIER J ET AL: "MECHANICAL EFFECTS INDUCED BY SHOCK WAVES GENERATED BY HIGH ENERGY LASER PULSES", JOURNAL DE PHYSIQUE III, EDITIONS DE PHYSIQUE, PARIS, FR, vol. 1, no. 9, 1 September 1991 (1991-09-01), pages 1467 - 1480, XP000461098, ISSN: 1155-4320

Cited by

CN110361121A

Designated contracting state (EPC)

DE FR GB

Designated extension state (EPC)

AL BA MK RS

DOCDB simple family (publication)

EP 2065477 A1 20090603; EP 2065477 B1 20160127; DE 102007056502 A1 20090604; DE 102007056502 B4 20100729; US 2009134130 A1 20090528; US 9096913 B2 20150804

DOCDB simple family (application)

EP 08019597 A 20081110; DE 102007056502 A 20071122; US 27566808 A 20081121