US009605328B2

(12) **United States Patent**
Sharman et al.

(10) **Patent No.: US 9,605,328 B2**
(45) **Date of Patent: Mar. 28, 2017**

(54) **SURFACE CONTOURING OF A WELD CAP AND ADJACENT BASE METAL USING ULTRASONIC IMPACT TREATMENT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 174 days.

(21) Appl. No.: **14/235,530**

(22) PCT Filed: **Jul. 30, 2012**

(86) PCT No.: **PCT/US2012/048658**
§ 371 (c)(1),
(2), (4) Date: **Jan. 28, 2014**

(87) PCT Pub. No.: **WO2013/019732**
PCT Pub. Date: **Feb. 7, 2013**

(65) **Prior Publication Data**

US 2014/0169863 A1 Jun. 19, 2014

Related U.S. Application Data

(60) Provisional application No. 61/513,103, filed on Jul. 29, 2011.

(51) **Int. Cl.**
B25G 3/34 (2006.01)
F16B 11/00 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***C21D 7/06*** (2013.01); ***B23K 9/02*** (2013.01); ***B23K 33/00*** (2013.01); ***C21D 9/50*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC Y10T 403/478; Y10T 29/49737; Y10T 29/49742; Y10T 29/49746; B23K 33/00;
(Continued)

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(57) **ABSTRACT**

A method for forming a smooth interface between a weld cap and an adjacent base metal utilizing ultrasonic impact treatment. The method improves the geometric profile of a weld while imparting a compressive residual stress layer on the weld metal and base metal thereby alleviating the tensile residual stresses imparted to the metals during welding. The contouring process does not remove material, as in grinding, but plastically deforms the surface being treated producing a densified surface, in turn providing a smooth weld cap and base metal surface finish without the loss of base or weld metal thickness.

19 Claims, 6 Drawing Sheets