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(54) **Method for simultaneous peening and smoothing.**

(57) A method for simultaneously shot peening and smoothing includes use of relatively large, smooth, hard, spherical steel shot having a substantially uniform diameter in the range 1–2.5 mm. Titanium work-pieces are provided in one step with a compressive stress layer of the order of 0.13 mm and a surface finish of better than 15×10^{-6} inch AA, compared to conventional peened finishes of the order of 40×10^{-6} inch AA. Surface finish and peening intensity are inter-related and dependent on shot diameter, mass, velocity, and energy within relatively small limits. The shot diameter is uniform within $\pm$ 0.05 mm; the shot impact velocity is uniform within $\pm$ 4 percent or less, in the range 1.4–12 m/s. The method is also applied to the simultaneous densification and smoothing of overlay coatings on workpieces- such as those deposited by physcial vapor deposition and plasma spraying. Usually heat treatment follows the peening step. When thin edged workpieces are peened they are oscillated through critical angles with respect to the collimated shot stream used in the invention. Thus, residual compressive stresses are obtained at the edges but damage from direct impact of the large shot is avoided.

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EUROPEAN SEARCH REPORT

Application number 0074918

EP 82 63 0084

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	US-A-4 287 740 (A. KUMAR) * Whole document *	9,10	C 21 D 7/04 C 21 D 7/06 C 22 F 1/18
A	US-A-4 222 793 (R.B. GRINDAHL) * Columns 5-6; claims *	1,3,4	
A	US-A-4 217 769 (W.A. DAMRAU) * Claim 1 *	1	
A,D	US-A-3 705 511 (W.W. BRANDEL et al.) * Claim 1 *	1,8	
A,D	US-A-3 542 530 (F.P. TALBOOM et al.) * Column 3 *	12-14	
A	GB-A-1 109 229 (KNAPSACK) * Whole document *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. ³) C 21 D B 24 C
A	ENGINEERING, vol. 216, no. 7, July 1976, pages I-VIII, London, GB R. JOHN: "Shot peening"		

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15-05-1984	MOLLET G.H.J.

CATEGORY OF CITED DOCUMENTS

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	MACHINERY AND PRODUCTION ENGINEERING, vol. 129, 4th August 1976, pages 98-102, Burgess Hill, US A. DART: "Improving fatigue strength of metals - 1" *		

TECHNICAL FIELDS SEARCHED (Int. Cl. 3)

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