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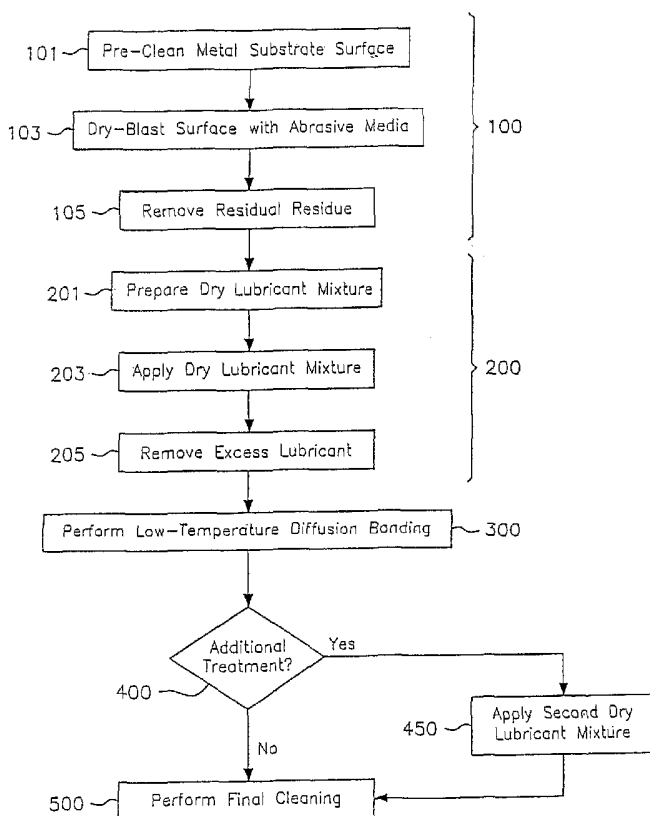
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[Continued on next page]

(54) Title: ENHANCED FRICTION REDUCING SURFACE AND METHOD OF MAKING THE SAME



(57) Abstract: A process for producing an enhanced friction reducing surface by bonding a dry lubricant to a substrate by way of high velocity mechanical impact and low temperature diffusion bonding, and the friction-reduced surface produced thereby. Kinetic energy produced from the mechanical impact drives the lubricant against the surface of the substrate, forming a metallurgical bond between the lubricant and the substrate surface. Performance of a subsequent low temperature solid state diffusion bonding step at less than half the melting point of the substrate causes, in combination with the stored bond energy, causes the lubricant to penetrate into the sub-surface of the substrate. The resulting substrate, modified at the sub-surface level but without any loss of metallurgical characteristics, demonstrates significantly improved wear and friction-reducing characteristics.

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INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 428/614, 687, 612; 72/53; 148/512, 559, 902; 384/625 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST: solid lubricant, MoS2, WS2, graphite, shot peen, embed, impregnate, diffuse, migrate, bearing, sliding, wearing,		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- A	US 2003/0000383 A1 (OGIHARA et al.) 02 January 2003 (02.01.2003), abstract and par [0001-0011]	22-27 ----- 1-21, 28-34
Y -- A	US 3,632,368 A (NELSON) 4 January 1970 (04.01.1970), col. 3, ln. 43 - col. 4, ln. 30); col. 2, ln. 1 - col. 3, ln. 66.	22-27 ----- 1-21 and 28-34
Y -- A	JP 11-315868 english machine translation (TAKAYUKI) 16 November 1999 (16.11.1999), abstract	22-27 ----- 1-21 and 28-34
A	US 4,508,396 A (DOI et al.) 02 April 1985 (02.04.1985), col. 2, ln. 27-60 and col. 6, ln. 17-44.	1-34
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Jennifer McNeil <i>J. McNeil</i> Telephone No. 571-272-1700 <i>ler</i>	

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,484,988 A (ROBINSON) 27 November 1984 (27.11.1984), col. 2, ln. 16 - col. 3, ln. 18 and col. 4, ln. 47- col. 5, ln. 16.	1-34
A	US 6,523,456 (KOBAYASHI et al.) 25 February 2003 (25.02.2003), col. 4, ln. 45-49.	1-34
A, T	UD 2005/0129803 A1 (UMEDA et al.) 16 June 2005 (16.06.2005), par [0002-0007].	1-34
X, T	JP 2006-131947 A (KAWAGOE et al.) 25 May 2006 (25.05.2006), DWPI abstract and	22-27
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Y		1-21 and 28-34