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(54) Title: WATER-BASED METALWORKING FLUID INCORPORATING POLYMERIC BORON MATERIALS

(57) Abstract: A water-based metalworking fluid is comprised of a polymeric boron species which includes at least B, N and H, together with a surfactant operable to provide an emulsion of the boron species with water. The polymeric boron species may be a polyborane or a borazine polymer and may be configured as a polyborane or borazine polymer backbone having side chains pendent thereupon. The side chains may include silicon and/or phosphorous. The silicon may be in the form of a silane or a siloxane species, including polymeric species. Disclosed are specific compositions as well as methods for using the compositions and methods for making the compositions.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 06/45906

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B21J 3/00 (2007.01)

USPC - 72/42

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC: 72/42

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 72/42,56,370,22,39-41,236; 83/22,24,77; 29/81.08,898.1 (text search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST (PGPB,USPT,USOC,EPAB,JPAB);DialogPro (General Research); Google Scholar

Fluid, metalworking, polymer, boron, polyborane, borazine, nitrogen, hydrogen, surfactant, silicon, phosphorous, side chain, silane, siloxane, pdms, polyaminoborane, crystal, fluoroalkyl, alkoxyl, benzotriazole, polyoxypropylene, alkanolamine

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/0072960 A1 (FERGUSON et al.) 07 April 2005 (07.04.2005), abstract, para [0003], [0007]-[0011], [0022]-[0025], [0028], [0048]-[0050], [0056], [0064], [0069]-[0073], [0079], [0088], [0089], [0092], [0102]-[0110] and claim 12.	1-17
Y	US 2005/0250668 A1 (SEROBIAN et al.) 10 November 2005 (10.11.2005), para [0029], [0030], [0035], [0043]-[0045], [0048], [0059]-[0062], [0083], [0091], [0098], [0142]-[0144] and [0154].	1-17
Y	US 5,693,596 A (KABURAGI et al.) 02 December 1997 (02.12.1997), abstract.	13
Y	US 2005/0038199 A1 (WANG et al.) 17 February 2005 (17.02.2005), para [0001]	15
A	US 5,234,506 A (WINSTON et al.) 10 August 1993 (10.08.1993), col 2, ln 3-17, col 3, ln 1-17, col 4, ln 3-22, col 4, ln 52-58, col 5, ln 50 - col 6, ln 51, col 6, ln 30-51 and col 17, ln 17-40.	15
A	US 2005/0003993 A1 (TSUMORI et al.) 06 January 2005 (06.01.2005), entire document.	1-17
A	US 4,772,546 A (DEGUCHI et al.) 20 September 1988 (20.09.1988), entire document.	1-17

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