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[Continued on next page]

- (54) **Title:** DOWNHOLE TOOL BEARING SYSTEM CONTAINING DIAMOND ENHANCED MATERIALS

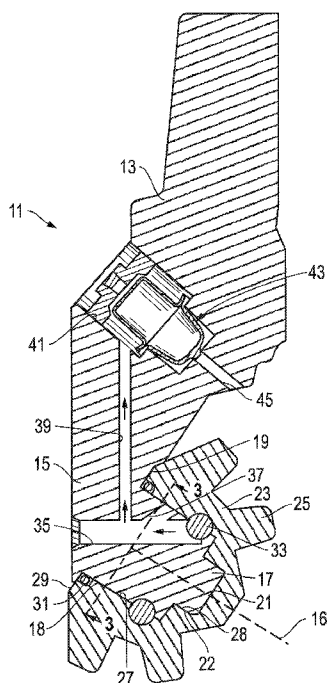


FIG. 1

- (57) **Abstract:** Downhole tool bearings are provided with diamond enhanced materials. The diamond enhanced materials comprise diamond grains in a matrix of tungsten or silicon carbide. A brazed diamond grit or diamond particles coated with a reactive braze may be utilized for bearing applications. Bearing rings formed at least in part with diamond enhanced material are installed on at least one of the bearing pin journal, the nose and the cone cavity. The bearing rings may be continuous rings or partial rings and attached to the journal pin or cone cavity. These may include thrust bearings, rollers, roller race, balls and ball races made of diamond enhanced material. These bearing surfaces also are formed at least in part with diamond enhanced material and attached to portions of the journal or cone bearing surfaces.



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INTERNATIONAL SEARCH REPORT

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PCT/US2009/034271**A. CLASSIFICATION OF SUBJECT MATTER****E21B 10/48(2006.01)i, E21B 10/02(2006.01)i**

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)

IPC E21B 10/22, E21B 10/46, E21B 15/02, F16C 17/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS (KIPO internal) & keywords: bit, body, leg, journal, bearing, diamond, and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 4738322 A (DAVID R HALL et al.) 19 April 1988 cited in the application See abstract; and figures 3-6, 12, 14-17	1, 2, 6-16, 18-25 ----- 3-5, 17
Y --- A	US 6068070 A (DANNY EUGENE SCOTT) 30 May 2000 cited in the application See abstract; and figures 1-6	1, 2, 6-16, 18-25 ----- 3-5, 17
Y --- A	US 6637528 B2 (AKIO NISHIYAMA et al.) 28 October 2003 See abstract; and figures 1, 2A-2D and 3A-3D	1, 2, 6-16, 18-25 ----- 3-5, 17
Y	US 5092687 A (DAVID R. HALL) 3 March 1992 See abstract; and column 3, lines 49-51	1, 2, 6-16, 18-25
Y	RAJENDRA K. SADANGI et al., WC-Co-DIAMOND NANO-COMPOSITES. NanoStructured Materials, 1999, Vol. 12, pages. 1031-1034. See abstract; and experimental aspects	1, 2, 6-16, 18-25

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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