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(54) Title: VITRIFIED SUPERABRASIVE TOOL AND METHOD OF MANUFACTURE

(57) Abstract: An abrasive tool includes a superabrasive grain component, a filler component that comprises hollow bodies and a vitreous bond. Natural and synthetic diamond, cubic boron nitride and combinations thereof can be employed as the superabrasive grain component. The vitreous bond component includes zinc oxide and at least two alkali metal oxides. The vitreous bond component can further include barium oxide. A method for producing an abrasive tool includes combining a superabrasive grain component, a filler component that includes hollow bodies and a vitreous bond component that includes zinc oxide and at least two alkali metal oxides. The combined components are fired at a temperature in a range of between about 600 °C and about 850 °C, preferably in an ambient air atmosphere.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/23536

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B23F 21/03; B24B 1/00
 US CL : 451/541; 51/295

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)
 U.S. : 451/541, 542, 544, 546; 51/295, 296, 297, 298, 307

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)
 search terms: abrasive tool, grinding wheel, diamond, hollow, zinc oxide, vitreous

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,472,461 A (LI, Rounan) 05 December 1995	
A	US 5,607,489 A (LI, Rounan) 04 March 1997	
A	US 6,019,668 A (RAMANATH et al) 01 February 2000	
A	US 6,093,092 A (RAMANATH et al) 25 July 2000	
A	US 6,093,225 A (ITOH, Kenji) 25 July 2000	
A	US 6,102,789 A (RAMANATH et al) 15 August 2000	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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