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[Continued on next page]

(54) **Title:** POLYCRYSTALLINE DIAMOND MATERIAL WITH HIGH TOUGHNESS AND HIGH WEAR RESISTANCE

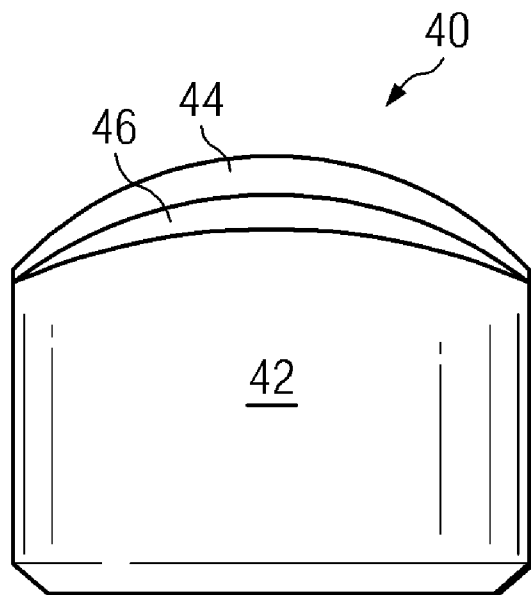


FIG. 4

(57) **Abstract:** A cutting element that includes a substrate; and an outer layer of polycrystalline diamond material disposed upon the outermost end of the cutting element, wherein the polycrystalline diamond material: a plurality of interconnected diamond particles; and a plurality of interstitial regions disposed among the bonded diamond particles, wherein the plurality of interstitial regions contain a plurality of metal carbide phases and a plurality of metal binder phases together forming a plurality of metallic phases, wherein the plurality of metal carbide phases are formed from a plurality of metal carbide particles; wherein the plurality of interconnected diamond particles form at least about 60 to at most about 80% by weight of the polycrystalline diamond material; and wherein the plurality of metal carbide phases represent at least 50% by weight of the plurality of metallic phases is disclosed.

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EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: 'diamond', 'carbide'

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| A | EP 0219959 A2 (SMITH INTERNATIONAL, INC.) 29 April 1987 See the abstract; columns 6,7,11,12; figures 3-5 | 1-22 |
| A | US 5370195 A (KESHAVAN et al.) 06 December 1994 See the abstract; figures 4,5; columns 6-8 | 1-22 |
| A | US 6290008 B1 (PORTWOOD et al.) 18 September 2001 See the abstract; column 11 | 1-22 |

Further documents are listed in the continuation of Box C.

See patent family annex.

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