

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 February 2009 (12.02.2009)

PCT

(10) International Publication Number
WO 2009/020761 A3

- (51) International Patent Classification:
B23Q 15/007 (2006.01) B23Q 15/013 (2006.01)
- (21) International Application Number:
PCT/US2008/070712
- (22) International Filing Date: 22 July 2008 (22.07.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
11/834,371 6 August 2007 (06.08.2007) US
- (71) Applicant (for all designated States except US): 3M
INNOVATIVE PROPERTIES COMPANY [US/US];
3M Center, Post Office Box 33427, Saint Paul, Minnesota
55133-3427 (US).
- (72) Inventors: BURKE, James P.; 3M Center, Post Office
Box 33427, Saint Paul, Minnesota 55133-3427 (US).
CAMPBELL, Alan B.; 3M Center, Post Office Box
33427, Saint Paul, Minnesota 55133-3427 (US). EHNES,

Dale L.; 3M Center, Post Office Box 33427, Saint Paul,
Minnesota 55133-3427 (US). WERTZ, Daniel S.; 3M
Center, Post Office Box 33427, Saint Paul, Minnesota
55133-3427 (US).

- (74) Agents: VIETZKE, Lance L. et al.; 3M Center, Office
of Intellectual Property Counsel, Post Office Box 33427,
Saint Paul, Minnesota 55133-3427 (US).
- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE,
EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID,
IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK,
LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW,
MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ,
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
ZW.
- (84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) Title: FLY-CUTTING SYSTEM AND METHOD, AND RELATED TOOLING AND ARTICLES

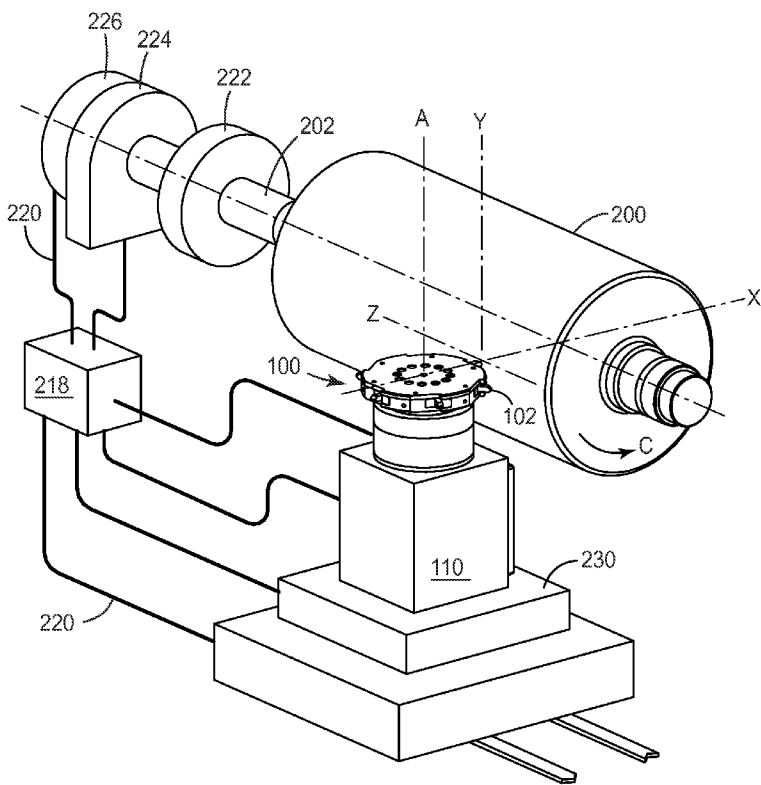


FIG. 2

(57) Abstract: Methods of fly-cutting a workpiece are disclosed, and in methods in which the position of a fly-cutting head or its associated cutting element is known as a function of time. Also disclosed are methods of forming features, such as grooves or groove segments, in a workpiece such as a cylindrical roll. The features may be provided according to one or more disclosed patterns. Articles made using tools machined in the manner described are also provided, such as polymeric film or sheeting that exhibit certain beneficial properties.

WO 2009/020761 A3



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,
NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG,
CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:

16 April 2009

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/070712**A. CLASSIFICATION OF SUBJECT MATTER****B23Q 15/007(2006.01)i, B23Q 15/013(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 8 ; B23Q, B23B, B23C

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)

eKIPASS (KIPO internal) & keywords: "tool", "cutter", "fly", "groove", and "roll"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 56 - 56317 A(SHIN NIPPON KOKI KK , NIPPON STEEL CORP) 18 May 1981 See thd whole document, Fig 1, 2, 4.	1 - 22
Y	JP 2004 - 358624 A(TOSHIBA MACH CO LTD) 24 Dec 2004 See Column 17 - 48, Fig 3 - 13.	1 - 22
A	JP 63 - 216651 A(INOUE JAPAX RES INC) 8 Sept 1988 See Column 3 - 8, Fig 1.	1 - 49
A	JP 60 - 221202 A(CANON INC) 5 Nov 1985 See Column 7 - 12, Fig 4 - 7.	1 - 49
A	JP 2002 - 160133 A(OKUMA CORP) 4. Jun 2002 See the abstract, Fig 1, 4.	1 - 49
A	US 2004/45419 A1(3M INNOVATIVE PROPERTIES COMPANY) 11 Mar 2004 See the abstract, Fig7, 8 10.	1 - 49

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

05 FEBRUARY 2009 (05.02.2009)

Date of mailing of the international search report

06 FEBRUARY 2009 (06.02.2009)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM, Sung Nam

Telephone No. 82-42-481-5410



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/070712

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 56-056317 A	18.05.1981	NONE	
JP 2004-358624 A	24.12.2004	KR 10-2004-0108580 US 2004-0244546 A1 US 6918326 B2	24.12.2004 09.12.2004 19.07.2005
JP 63-216651 A	08.09.1988	NONE	
JP 60-221202 A	05.11.1985	NONE	
JP 2002-160133	04.06.2002	JP 2002-160133 A JP 3961214 B2	04.06.2002 22.08.2007
US 2004/45419 A1	11.03.2004	NONE	