

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/030804

A. CLASSIFICATION OF SUBJECT MATTER

INV. E21B10/567 B23B51/00 B21K5/02
ADD.

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)

E21B

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)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 881 830 A (COOLEY CRAIG H [US]) 16 March 1999 (1999-03-16) column 7, lines 4-8 column 8, line 27 - column 9, line 4 column 9, lines 33-49; figures 3-5 -----	1-5, 8-12, 15, 16, 33-35
X	US 2005/247492 A1 (SHEN YUELIN [US] ET AL) 10 November 2005 (2005-11-10) paragraph [0077]; figure 13 -----	1-5, 8-10, 12, 33-35



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 another 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

9 September 2013

Date of mailing of the international search report

25/11/2013

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5881830	A	16-03-1999	BE 1012649 A5 06-02-2001
		GB 2323398 A	23-09-1998
		US 5881830 A	16-03-1999

US 2005247492	A1	10-11-2005	CA 2505709 A1 30-10-2005
		CA 2505710 A1	30-10-2005
		CA 2505828 A1	30-10-2005
		GB 2424017 A	13-09-2006
		US 2005247492 A1	10-11-2005
		US 2011031030 A1	10-02-2011

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5, 8-12, 15, 16, 33-35

Cutter having a cutting face oriented at least in part at a given angle to its longitudinal axis

2. claims: 6, 7, 17, 31, 32(completely); 18-22(partially)

Cutter having a cutting face oriented at least in part at a given angle to its longitudinal axis and having a given surface roughness

3. claims: 13, 14(completely); 18-22(partially)

Cutter having a cutting face oriented at least in part at a given angle to its longitudinal axis, wherein the oriented part is arranged in a ring

4. claims: 23-30

Cutter having a cutting face oriented at least in part at a given angle to its longitudinal axis and designed to withstand a given load

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

"see additional sheet(s)"

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.