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(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, CL, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: METHOD OF DISINTEGRATING MATERIALS AND DEVICE FOR PERFORMING THE METHOD

(57) Abstract: The invention describes a method of non-contact disintegrating materials, for performing underground drillings. The method uses the synergy of a source of hydraulic pressure medium and the pressure effect for acting through the medium to disintegrate material.

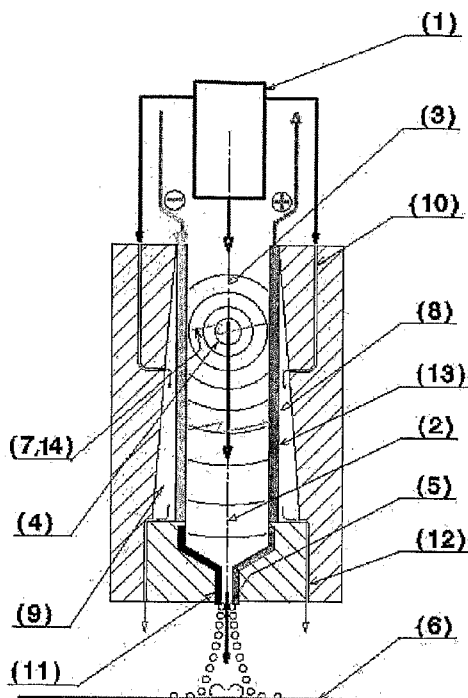


Fig. 1



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

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

17 November 2011

Published:

— *with international search report (Art. 21(3))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/SK2010/050016

A. CLASSIFICATION OF SUBJECT MATTER
INV. E21B7/14 E21B7/18
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 practical, 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 3 700 169 A (NAYDAN THEODORE T ET AL) 24 October 1972 (1972-10-24) column 3, lines 54-57 page 4, lines 31-44; figures 1, 2 -----	1-3,6,8
X	US 3 647 137 A (NAYDAN THEODORE T) 7 March 1972 (1972-03-07) column 3, lines 1-60; figures 1, 2 -----	1-3,6,8
X	US 6 138 775 A (PUETTMANN FRANZ-JOSEF [DE]) 31 October 2000 (2000-10-31) column 1, line 63 - column 2, line 18; figure 1 -----	1-3,6,8
X	US 4 004 737 A (AKER WALTER W ET AL) 25 January 1977 (1977-01-25) column 1, line 63 - column 2, line 49; figures 1-1A -----	1-3,6,8



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 document 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

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Date of mailing of the international search report

27/09/2011

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SK2010/050016

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.: 4, 5, 10, 13
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:
see FURTHER INFORMATION sheet PCT/ISA/210
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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/SK2010/050016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3700169	A	24-10-1972	AT 311909 B 10-12-1973
			AT 318521 B 25-10-1974
			AU 3473371 A 03-05-1973
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US 6138775	A	31-10-2000	DE 19725052 A1 24-12-1998
			EP 0884446 A2 16-12-1998
US 4004737	A	25-01-1977	NONE

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 2, 3, 6, 8, 9, 11, 12(completely); 1(partially)

Method and apparatus for disintegrating material by means of
a pressurized medium and an electric arc

2. claims: 7(completely); 1(partially)

Method and apparatus for disintegrating material by means of
a pressurized medium and fuel detonation

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 4, 5, 10, 13

The subject-matter of claims 4, 10 and 13 is so unclear that it is not possible to understand the meaning of the claimed features or the way they contribute to a technical result. Therefore these claims cannot be examined. Claim 5 is constructed as dependent in claims 1-4. However, feature (9) of this claim is defined only in claim 4 and therefore dependency of this claim is wrongly formulated in claims 1-3. Claim 5 is therefore dependent only in claim 4 cannot be understood as entirely depending in an unclear claim 4.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.