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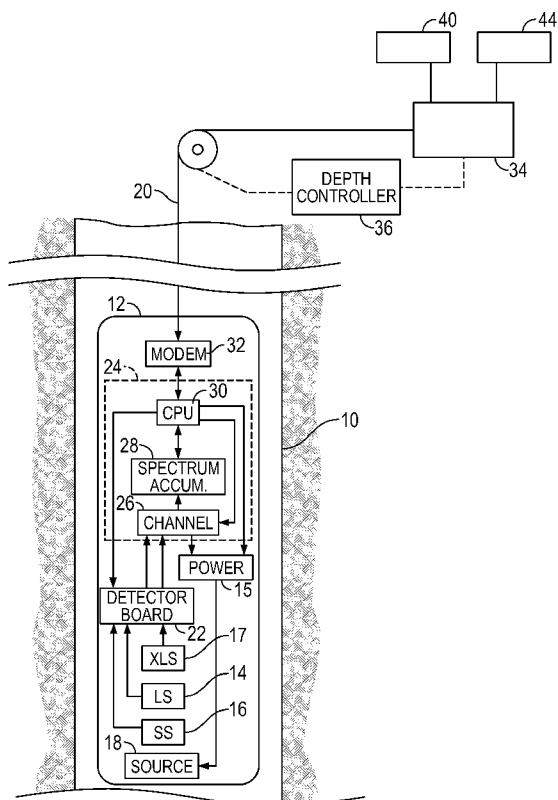
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[Continued on next page]

(54) Title: MEASUREMENT OF FORMATION POROSITY USING A SINGLE GAMMA RAY DETECTOR

(57) Abstract: A pulsed neutron source is used in a porosity logging tool with a single gamma ray detector coated with a neutron absorbing material. By using a ratio of the spectral peak associated with hydrogen to a spectral peak associated with the neutron absorbing material, the formation porosity is estimated.



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

**Published:**

- *with international search report (Art. 21(3))*
- *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:**

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

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

14 March 2013

**A. CLASSIFICATION OF SUBJECT MATTER***G01V 5/12(2006.01)i, G01N 23/09(2006.01)i, G01N 33/24(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)

G01V 5/12; G01T 3/06; G01V 5/00; G01V 5/10

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

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) &amp; Keywords: neutron, porosity, gamma rays

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 4122339 A (HARRY D. SMITH, JR. et al.) 24 October 1978 See column 3, line 11 - column 6, line 19 and figures 1,2.	1,2,4-7,9-12 3,8
Y	US 6373066 B1 (DAVID G. PENN) 16 April 2002 See column 3, line 8 - column 4, line 55 and figures 1-3.	1,2,4-7,9-12
A	US 3413470 A (L. S. ALLEN, JR. et al.) 26 November 1968 See column 2, line 36 - column 4, line 7 and figures 1-3.	1,6,11
A	US 7365307 B2 (STOLLER CHRISTIAN et al.) 29 April 2008 See column 4, line 1 - column 5, line 3 and figures 1-3.	1,6,11
A	US 2010-0019138 A1 (GALFORD JAMES E. et al.) 28 January 2010 See paragraphs 24-34 and figures 1,2.	1,6,11

 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

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"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

14 JANUARY 2013 (14.01.2013)

Date of mailing of the international search report

**17 JANUARY 2013 (17.01.2013)**

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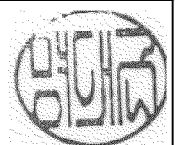
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/043301**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4122339 A	24.10.1978	None	
US 6373066 B1	16.04.2002	CA 2312593 A1 CA 2312593 C EP 1081509 A2 EP 1081509 A3 NO 20004178 A NO 20004178 D0	20.02.2001 21.06.2005 07.03.2001 17.04.2002 21.02.2001 21.08.2000
US 3413470 A	26.11.1968	None	
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