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[Continued on next page]

(54) Title: DOWNHOLE TOOLS HAVING COMBINED D-D AND D-T NEUTRON GENERATORS

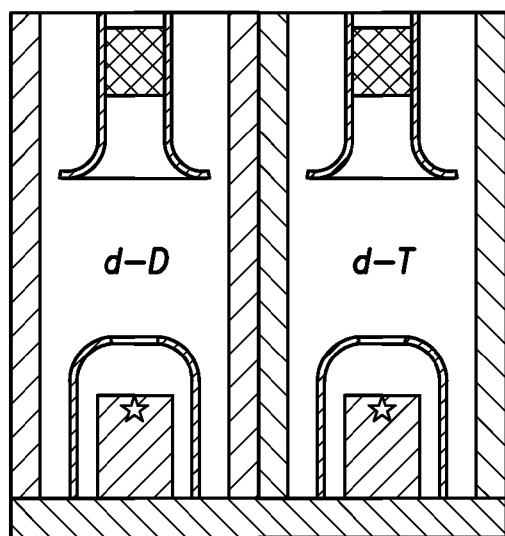


FIG.4A

(57) Abstract: A nuclear tool includes a tool housing; a d-D neutron generator disposed in the tool housing; a d-T neutron generator disposed in the tool housing; and, optionally, a control circuit for controlling pulsing of the d-D neutron generator and the d-T neutron generator. A method for well-logging using a nuclear tool includes disposing the nuclear tool in a wellbore penetrating a formation; pulsing a d-D neutron generator to emit neutrons at a first energy level into the formation; pulsing a d-T neutron generator to emit neutrons at a second energy level into the formation; and measuring signals returning from the formation.



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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G01V

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 828 917 A (SCHLUMBERGER WELL SURV CORP) 24 February 1960 (1960-02-24) page 1, column 1, line 17 - line 26 page 4, column 2, line 89 - line 97 page 4, column 2, line 103 - line 111 page 4, column 2, line 71 - line 80 page 4, column 2, line 120 - line 123 claim 1; figure 4	1-3,5,8, 10-14
A	US 3 509 343 A (LOCKE STANLEY) 28 April 1970 (1970-04-28) column 3, line 16 - line 58; figure 1 ----- -/--	1,4,15

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 654 467 A (TITTMAN JAY ET AL) 4 April 1972 (1972-04-04) column 2, line 75 - column 3, line 6 column 3, line 20 - line 24 column 3, line 48 - line 50 figure 1 -----	1, 4, 15
A	US 4 066 892 A (GIVENS WYATT W) 3 January 1978 (1978-01-03) abstract -----	1, 4, 15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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