

Title (en)
AN APPARATUS FOR THERMAL SPALLATION OF A BOREHOLE

Title (de)
VORRICHTUNG ZUR THERMISCHEN SPALLATION EINES BOHRLOCHS

Title (fr)
APPAREIL DE SPALLATION THERMIQUE D'UN Puits DE FORAGE

Publication
EP 3450675 A1 20190306 (EN)

Application
EP 17188149 A 20170828

Priority
EP 17188149 A 20170828

Abstract (en)
The present invention refers to an apparatus for thermal spallation of a borehole, wherein the borehole comprises a proximal region with a borehole fluid with a pressure p H₂O , and a distal region filled with a fluid, in particular filled with an exhaust gas, with a pressure p gas,out . The apparatus comprises at least one section with a thermal spallation system having a predetermined weight adapted for insertion down into the distal region of the borehole, and at least one barrier section, comprising at least one element that is designed to form a barrier between the distal region of the borehole filled with a gas and the proximal region of the borehole filled with the borehole fluid, and that is arranged adjacent to the at least one section with the thermal spallation system. The at least one element, forming a barrier between the distal and proximal region, is designed to adapt in a dynamic manner to changing pressure p H₂O of the borehole fluid in the proximal region and/or to changing pressure p gas,out of the fluid, in particular gas in the distal region of the borehole such that a flow of the borehole fluid from the proximal region of the borehole towards the distal end of the borehole is prevented, and/or a pressure accumulation of the fluid, in particular gas in the distal region beyond a certain pressure threshold, which corresponds to the weight of the section with the thermal spallation system, is prevented.

IPC 8 full level
E21B 7/14 (2006.01); **E21B 7/18** (2006.01); **E21B 7/28** (2006.01); **E21B 33/12** (2006.01); **E21B 33/127** (2006.01); **E21B 33/128** (2006.01)

CPC (source: EP)
E21B 7/14 (2013.01); **E21B 7/18** (2013.01); **E21B 7/28** (2013.01); **E21B 33/1208** (2013.01); **E21B 33/1277** (2013.01); **E21B 33/1285** (2013.01)

Citation (applicant)
• REINICKE ET AL.: "Hydraulic fracturing stimulation techniques and formation damage mechanism", CHEMIE DER ERDE, vol. 70, no. S3, 2010, pages 107 - 117, XP027221553
• KANT ET AL.: "Thermal Spallation Drilling - an Alternative Drilling Technology for Hard Rock Drilling", OIL GAS EUROPEAN MAGAZINE, 2017
• LAWERENCE ET AL.: "Effect of Perforation Job on Formation Damage", JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY, 2013, pages 2 - 10
• PORTIER ET AL.: "Review on chemical stimulation techniques in oil industry and applications to geothermal systems", TECHNICAL REPORT - DEEP HEAT MINING ASSOCIATION, 2007
• K. HARBY ET AL.: "An experimental investigation on the characteristics of submerged horizontal gas jets in liquid ambient", EXPERIMENTAL THERMAL AND FLUID SCIENCE, vol. 53, 2014, pages 26 - 39

Citation (search report)
• [X] WO 2012018830 A1 20120209 - POTTER DRILLING INC [US], et al
• [A] US 5771984 A 19980630 - POTTER ROBERT M [US], et al
• [A] US 2010089574 A1 20100415 - WIDEMAN THOMAS W [US], et al

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

DOCDB simple family (publication)
EP 3450675 A1 20190306; WO 2019042755 A1 20190307

DOCDB simple family (application)
EP 17188149 A 20170828; EP 2018071931 W 20180813