

Title (en)  
BOREHOLE SEALING AND IMPROVED FOAM PROPERTIES FOR CONTROLLED FOAM INJECTION (CFI) FRAGMENTATION OF ROCK AND CONCRETE

Title (de)  
BOHRLOCHABDICHTUNG UND VERBESSERTE SCHAUMEIGENSCHAFTEN FÜR DIE KONTROLLIERTE FRAGMENTIERUNG VON GESTEIN UND BETON DURCH SCHAUMINJEKTION (CFI)

Title (fr)  
ÉTANCHÉITÉ DE TROU DE FORAGE ET PROPRIÉTÉS DE MOUSSE AMÉLIORÉES POUR UNE FRAGMENTATION, PAR INJECTION DE MOUSSE CONTRÔLÉE, DE ROCHE ET DE BÉTON

Publication  
**EP 4278066 A1 20231122 (EN)**

Application  
**EP 21704148 A 20210115**

Priority  
US 2021013561 W 20210115

Abstract (en)  
[origin: WO2022154797A1] Breaking rock and concrete, based upon a Controlled-Foam Injection or PCF (Penetrating Cone Fracture) uses a high-pressure fluid to pressurize a pre-drilled hole. A high pressure seal (18) is formed between the injection barrel (2) and walls of the pre-drilled hole in the material to be broken. A leak-free poppet valve holds a fluid in a pressure vessel before rapid discharge. Variable charges of foam/ water are generated and delivered to the breaker. The injection barrel (2) is prefilled with a low viscosity fluid. An annular reverse acting poppet valve allows concurrent injection of chemical additives and/or micro particles to modify foam viscosity during its high pressure release into the material to be broken. A high pressure foam generator (55) is compact and reliable. Removal and wash-out of the seal frees the injection barrel.

IPC 8 full level  
**E21C 37/06** (2006.01); **E21C 37/12** (2006.01)

CPC (source: EP KR)  
**E21C 37/06** (2013.01 - EP); **E21C 37/12** (2013.01 - EP KR)

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

Designated validation state (EPC)  
KH MA MD TN

DOCDB simple family (publication)  
**WO 2022154797 A1 20220721**; AU 2021418701 A1 20230824; AU 2021418701 B2 20240912; CA 3204933 A1 20220721; EP 4278066 A1 20231122; JP 2024505823 A 20240208; KR 20230145573 A 20231017; MX 2023008415 A 20231019; PE 20240494 A1 20240315; ZA 202108841 B 20221130

DOCDB simple family (application)  
**US 2021013561 W 20210115**; AU 2021418701 A 20210115; CA 3204933 A 20210115; EP 21704148 A 20210115; JP 2023543081 A 20210115; KR 20237027577 A 20210115; MX 2023008415 A 20210115; PE 2023002090 A 20210115; ZA 202108841 A 20211109