

Title (en)

ARTIFICIAL SUBTERRANEAN CAVERN FOR THE STORAGE OF NATURAL GAS IN THE GASEOUS STATE AT AN ELEVATED PRESSURE AND A LOW TEMPERATURE, AND METHOD FOR ITS PRODUCTION

Publication

EP 0377405 B1 19920401 (DE)

Application

EP 89810902 A 19891124

Priority

CH 451588 A 19881206

Abstract (en)

[origin: EP0377405A1] The artificial subterranean cavern (1) for the storage of natural gas at an elevated pressure and a low temperature has a casing (2) which is attached at a distance of a few centimetres from the cavern wall and ends above the cavern base surface. The cavern (1) is closed off from the atmosphere by a billet (4) through which feed and delivery lines (5, 6, 7) are run which lead into the gap space (8) between the casing (2) and the cavern wall or into the storage space (9). After the cavern (1) is vented, water is forced into the gap space (8) by means of a pressure gas. This water as well as a water layer still located above the cavern base surface is then frozen by means of a liquid coolant circulating through the inner space of the cavern (1), in the course of which the coolant boils and evaporates. When natural gas is stored in the cavern (1) at an elevated pressure and a low temperature, methane hydrates form in the open locations (cracks or small openings) of the casing (2) through contact with the ice, which methane hydrates seal off the casing (2) gas-tight from the surrounding rock. Such a method enables a gas-tight cavern (1) for the storage of natural gas at an elevated pressure and a low temperature to be economically produced. <IMAGE>

IPC 1-7

B65G 5/00; F17C 3/00

IPC 8 full level

F17C 3/00 (2006.01)

CPC (source: EP)

F17C 3/005 (2013.01); **F17C 2201/052** (2013.01); **F17C 2221/033** (2013.01); **F17C 2221/038** (2013.01); **F17C 2223/0123** (2013.01); **F17C 2223/0161** (2013.01); **F17C 2223/036** (2013.01); **F17C 2270/0144** (2013.01); **F17C 2270/016** (2013.01)

Cited by

CN108150220A; EP0963780A1; CN104386409A; CN105545359A; US6374844B1; US6664101B2; DE102023101619B3; WO9941164A1; WO2019080219A1

Designated contracting state (EPC)

CH DE FR GB IT LI NL

DOCDB simple family (publication)

EP 0377405 A1 19900711; EP 0377405 B1 19920401; CA 2004000 A1 19900606; DE 58901092 D1 19920507; FI 895818 A0 19891205; NO 171329 B 19921116; NO 171329 C 19930224; NO 894870 D0 19891205; NO 894870 L 19900607; SE 8904075 D0 19891201; SE 8904075 L 19900607

DOCDB simple family (application)

EP 89810902 A 19891124; CA 2004000 A 19891128; DE 58901092 T 19891124; FI 895818 A 19891205; NO 894870 A 19891205; SE 8904075 A 19891201