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(54) **A METHOD FOR PREDICTING CRUMPS AND METHANE HAZARD**

(57) The invention pertains to a method A method for predicting crumps and methane hazard.

A method for predicting crumps and methane hazard characterized in that, when using a continuous monitoring system in sections of powered roof supports installed

on exploited walls, pressure values are recorded in the elements of the powered roof support and, in real time, based on known changes in the value of pressure, the occurrence and location of crumps of the rock mass and methane hazard are anticipated.

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## Description

**[0001]** The invention pertains to a method for predicting crumps and methane hazard.

**[0002]** Patent application PL 178986 describes a method of forecasting of rock mass crumps and provoking crumps. The method consists in drilling in a crump-producing area a small-diameter hole with a seismic-acoustic sensor placed at the end. Signals from the sensor are sent to an interpretation system that determines the probability of occurrence of a high-energy shock of the rock mass that initiates a crump. If a hazard is present, signals from the interpretation system blow up the explosive material placed previously in the drilled hole. The explosion provokes a control crump of the rock mass.

**[0003]** Patent application PL 165582 describes a method of limitation of roof crumps. The invention is applied when performing mining works in the vicinity of large vertical cracks in the rock mass with delamination at the contact of strata of different susceptibility. The method of limitation of roof crumps consists in drilling at least one hole to the delamination between a brittle rock layer and a solid rock layer and pumping a medium that fills the delamination through the hole.

**[0004]** The essence of the invention is the use of changes in pressure that take place in the rock mass before a crump and the use of such changes to anticipate possible occurrence of a crump.

**[0005]** Although a change in the pressure is known, there are no solutions that enable collecting an appropriate quantity of data and analyzing it in real time. It turned out that elements that can be measured to acquire relevant data are elements of powered roof supports installed in exploited walls.

**[0006]** The method for predicting crumps and methane hazard according to the invention is characterized in that, when using a continuous monitoring system in sections of powered roof supports installed on exploited walls, pressure values are recorded in the elements of the powered roof support and, in real time, based on known changes in the value of pressure, the occurrence and location of crumps of the rock mass and methane hazard are anticipated.

**[0007]** Preferably, pressure is recorded in individual working actuators, in auxiliary systems, and in control and protection equipment (safety valves, overflow valves, limit valves).

**[0008]** All geological phenomena, after completion of a preliminary analysis of the monitored parameters, are preceded by specific changes (rapid increases and/or decreases of strain). Based on this, critical ranges have been elaborated which will inform and warn mine supervision staff about the risk of crumps or methane hazard. Such algorithms will also enable to precisely define the hazard zone (area) based on continuous monitoring, according to the number of the section that records critical ranges of the parameters (wall inlet, bottom gallery, or adjacent area).

## Claims

1. A method of for predicting crumps and methane hazard **characterized in that**, when using a continuous monitoring system in sections of powered roof supports installed on exploited walls, pressure values are recorded in the elements of the powered roof support and, in real time, based on known changes in the value of pressure, the occurrence and location of crumps of the rock mass and methane hazard are anticipated.
2. A method according to claim 1 **characterized in that** pressure is recorded in individual working actuators, in auxiliary systems, and in control and protection equipment (safety valves, overflow valves, limit valves).



## EUROPEAN SEARCH REPORT

Application Number  
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 July 2016	Examiner van Berlo, André
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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The members are as contained in the European Patent Office EDP file on  
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- PL 178986 [0002]
- PL 165582 [0003]