Patent for automatic hole alignment of down-the-hole drilling rig

What is an automatic hole positioning and alignment system?
This work describes an automatic hole positioning and alignment system developed for drill rigs. The novelty of the solution is in the surface drilling application and the versatility of a typical drill boom. The system has been tested both in a simulated and a prototype environment.

Why do drill rigs have automatic positioning?
Automatic positioning makes it possible to operate one or more drill rigs more conveniently from a remote control station. The automatic mode is also an enabler technology for autonomous drill rigs. Remote operation and autonomy minimize the need for human intervention and presence at the work site.

How is a drill hole determined?
A drill hole is determined by its starting point on the rock surface,alignment,and depth,as defined in a drilling plan. Prior to actual drilling,the drilling boom must be correctly placed to achieve desired position and alignment of the hole,see Figure 2. Positioning of a drill hole has to be done with a centimeter level accuracy.

What is a drill rig control system?
The drill rig control system is a complex distributed system. Development and integration of a new feature into a distributed control system is challenging with regard to development time and performance verification. The algorithms developed herein were complicated,making these challenges even harder.

What is a surface drill rig?
A modern surface drill rig. According to its name, the method involves drilling holes into rock for charging of explosives and consequently detonating the explosives to fracture and move the rock mass. In open pit mines, quarries and construction sites, the holes are drilled using surface drill rigs, see Figure 1 for an example.

How does a drill rig work?
From the user control commands,the control system of the drill rig forms control signals to the hydraulic valves regulating the oil flow to the boom actuators,which are typically hydraulic cylinders. In the direct control mode,each valve and actuator is controlled individually.

Discover the impact of Down the Hole Hammers (DTH hammers) in urban redevelopment projects. Learn how these specialized tools enable ...

HISTORICAL PERSPECTIVE ON PRODUCTION DRILLING METHODS Air-flushed drilling with top hammers began in the mining industry in Sweden in 1873, while down-the-hole (DTH) ...

Discover the impact of Down the Hole Hammers (DTH hammers) in urban redevelopment projects. Learn

how these specialized tools enable geotechnical engineers to ...

Discover the benefits of large-diameter DTH hammer drilling technology. Achieve efficient, precise, and sustainable deep hole drilling for ...

An integrated down the hole drilling machine, also known as a one-piece drill rig, or crawler DTH drilling rig is a powerful and versatile machine used in the ...

A method for automated control of a drilling operation of a blast hole drilling machine using a down-the-hole drill bit mounted on a drill string is disclosed. The method may include: ...

In down-the-hole drilling a drill rod is fitted with a hammer at its lower end. The hammer, which is mounted on the drill bit, is activated through the addition of ...

The HFKT7D integrated down the hole drill rig for open use is an advanced drilling device integrating the down the hole drilling system and screw air compressor system, It is capable of ...

Discover the power of down the hole drilling technology featuring superior performance in hard rock, enhanced accuracy, and advanced automation capabilities for efficient and precise ...

A laser alignment device for a drill rig having an elongate drill rod, the laser alignment device including a head unit having at least a pair of laser emitting devices mounted independently to ...

TECHNICAL SPECIFICATION Leopard DI650i is a diesel powered, self-contained crawler mounted intelligent down-the-hole drill rig designed for demanding high-capacity production ...

The KT25 integrated down the hole drill rig for open use can drilling vertical,inclined and horizontal holes,mainly used for open-pit mine,stonework ...

A down-the-hole drill, usually called DTH Drilling Rig, is basically a mini jackhammer screwed on the bottom of a drill string. The speedy hammer ...

Mankind is using hammer and chisel for rock-destruction since the stone age until today. This article shows which ideas and inventions were made in the past to put the hammering into an ...

Drill rig alignment and borehole positioning are two critical elements of any drilling program. Measuring the alignment of a drill rig accurately is critical in maintaining an effective drilling ...

Learn how to use down-the-hole hammers to enhance pile driving construction, improving efficiency, reducing costs, and ensuring high-quality ...

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A drill rod alignment detector system including a laser device mounted relative to a drill rig for indicating a drill rod orientation and an alignment detector device adapted to be placed at least ...

The rig is most commonly used for open-pit mines, stonework blast holes, and pre-splitting holes. The drill rig is equipped with an automatic rod handling system and lubricating module of the ...

The technology of down-the-hole drilling rig and eccentric bit is applied in drilling equipment and methods, drilling equipment, earth-moving drilling and other directions, and can solve the ...

A technology of positioning device and down-the-hole drilling rig, which is applied to supporting devices, drilling equipment, directional drilling, etc., can solve the problems of cumbersome ...

Drilling Methods The components of a drill rig are (1) the rig itself, which supplies the power to mobilize, drill rock, and remove the drill cuttings from the hole; (2) the mounting; (3) the drill ...

Down-the-hole D460A drill rig: handles 115-152mm holes up to 35m deep, with a Cummins engine, heavy-duty boom, and hydraulic feed. Includes a 2000 ...

Down-the-Hole (DTH) drilling is a technique used to create deep, precise holes in hard rock and challenging ground conditions. In this method, ...

With the foregoing in view, the present invention in one broad form, resides in an alignment system for alignment of a drill rod during drilling of the hole including a laser device mounted ...

The Azimuth Aligner is used in mining exploration to automate the drill-rig alignment process and enhance accuracy and efficiency. According to ...

The invention relates to the field of drilling machine equipment, and particularly discloses a full-automatic down-the-hole drilling machine which comprises an installation frame, wherein a ...

The most productive drill available for rotary tricone and down the hole drilling of 171mm to 270mm (6-3/4" to 10-5/8 ") holes with up to 59 ft (18 m) clean hole ...

Another object of this invention is to provide a boom with such rotatable clamps wherein the clamp can be rotated to bring a clamped down-hole tubular into alignment with the drilling axis of the ...

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TECHNICAL SPECIFICATION Sandvik intelligent drilling jumbo fleet (DD422i, DT922i, DT912D, DT1132i and DT1232i) represents an advanced control system based electro- and diesel ...

KT11 integrated surface DTH drilling rig is using Cummins three diesel engines as a single power, by both ends of the output at the same time to drive the screw ...

While such an approach provides a superior accuracy of the holes in comparison to conventional systems, the boom still has to be positioned manually using the rig controls. This work ...

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