

Title (en)
Hydraulic optimization of drilling fluids in borehole drilling

Title (de)
Hydraulische Optimierung von Bohrflüssigkeiten im Erdbohren

Title (fr)
Optimisation hydraulique des fluides de forage dans le forage de puits

Publication
EP 1398456 A2 20040317 (EN)

Application
EP 03255100 A 20030818

Priority
US 31948102 P 20020821

Abstract (en)
A method for optimizing drilling fluid hydraulics when drilling a well bore (10) is disclosed. The drilling fluid is supplied by a surface pump (22) through a drill string (16) to a drill bit (18). The method has the step of adjusting the flow rate of a surface pump (22) and a fluid pressure drop across the drill bit (18) while drilling such that the drilling fluid hydraulics are optimized for a given drilling condition. In order for the flow through all the devices (26) in the drill string (16) to also be optimized, the flow through the devices (26) is adjusted, thereby setting the pressure drop and the fluid flow rate through each device (26). As required for the overall system, the flow from the surface pump (22) is increased or decreased as necessary.
<IMAGE>
A process for adjustably selecting the pressure drop and/or flow rate across a mud-powered device for borehole drilling in a drill string independently of each other, and adjustably controlling the size of the fluid discharge orifices in drill bits : Drilling fluid hydraulics are optimized when drilling a well bore when the fluid is supplied by a surface pump through a drill string to a drill bit. The process comprises adjusting the flow rate of the pump and the pressure drop across the bit while drilling such that the hydraulics are optimized for a given drilling condition. Independent claims are also included for a similar process, where the pressure of the fluid is monitored at the device, adjusting the flow rate of the pump, and controlling the pressure drop by restricting, bypassing or relieving the fluid flow. Also, a drilling fluid using device for use in a drill string and a drill string for drilling the well bore comprising a drill bit, each comprising a fluid flow restricting device and fluid flow relief device that are remotely adjusted in operation to achieve optimum hydraulics through the it.

IPC 1-7
E21B 21/08; **E21B 21/00**; **E21B 21/10**

IPC 8 full level
E21B 10/60 (2006.01); **E21B 10/62** (2006.01); **E21B 21/08** (2006.01); **E21B 21/10** (2006.01)

CPC (source: EP US)
E21B 10/60 (2013.01 - EP US); **E21B 10/62** (2013.01 - EP US); **E21B 21/08** (2013.01 - EP US); **E21B 21/10** (2013.01 - EP US)

Cited by
GB2415000A; GB2415000B; US11891894B2; WO2021061103A1

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

DOCDB simple family (publication)
EP 1398456 A2 20040317; **EP 1398456 A3 20050323**; CA 2437519 A1 20040221; US 2004108138 A1 20040610

DOCDB simple family (application)
EP 03255100 A 20030818; CA 2437519 A 20030819; US 60471403 A 20030812