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- (71) Applicant (for all designated States except US):
CHEVRON U.S.A. INC. [US/US]; 6001 Bollinger Canyon Road -3rd Floor, San Ramon, California 94583 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **CALHOUN, William, Malcolm** [US/US]; 11 Rountop Place, The Woodlands, Texas 77381 (US). **CAICEDO, Hector, Ulpiano** [US/US]; 13002 Fox Brush Lane, Houston, Texas 77041 (US). **EWY, Russell, Thomas** [US/US]; 800 Springbrook Drive, San Ramon, California 94583 (US).
- (74) Agents: **SCHULTE, Richard, J.** et al.; Chevrontexaco Corporation, Law Department, Post Office Box 6006, San Ramon, California 94583-0806 (US).

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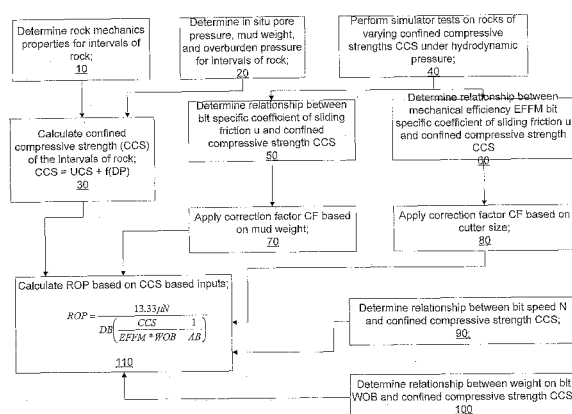
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(54) Title: METHOD FOR PREDICTING RATE OF PENETRATION USING BIT-SPECIFIC COEFFICIENTS OF SLIDING FRICTION AND MECHANICAL EFFICIENCY AS A FUNCTION OF CONFINED COMPRESSIVE STRENGTH



(57) Abstract: A method for predicting the rate of penetration (ROP) of a drill bit drilling a well bore through intervals of rock of a subterranean formation is provided. The method uses an equation based upon specific energy principles. A relationship is determined between a bit-specific coefficient of sliding friction μ and confined compressive strength CCS over a range of confined compressive strengths CCS. Similarly, another relationship for the drill bit is determined between mechanical efficiency EFF_M and confined compressive strength CCS over a range of confined compressive strengths CCS. Confined compressive strength CCS is estimated for intervals of rock through which the drill bit is to be used to drill a well bore. The rate of penetration ROP is then calculated utilizing the estimates of confined compressive strength CCS of the intervals of rock to be drilled and those determined relationships between the bit-specific coefficient of sliding friction μ and the mechanical efficiency EFF_M and the confined compressive strengths CCS, as well as using estimated drill bit speeds N (RPM) and weights on bit (WOB).