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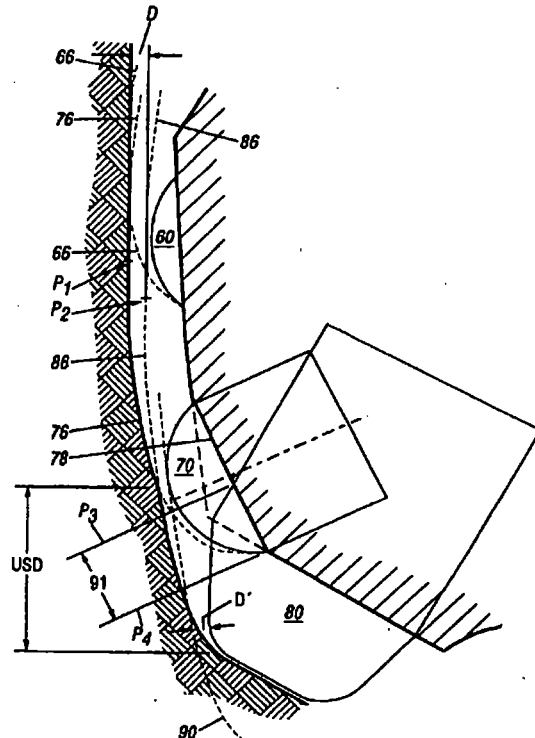
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : E21B 10/16		A1	(11) International Publication Number: WO 97/38205
			(43) International Publication Date: 16 October 1997 (16.10.97)
(21) International Application Number: PCT/US97/05948			(81) Designated States: AU, CA, GB, SE, SG.
(22) International Filing Date: 10 April 1997 (10.04.97)			Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(30) Priority Data: 08/630,517 10 April 1996 (10.04.96) US 08/667,758 21 June 1996 (21.06.96) US			
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(54) Title: ROLLING CONE BIT WITH ENHANCEMENTS IN CUTTER ELEMENT PLACEMENT AND MATERIALS TO OPTIMIZE BOREHOLE CORNER CUTTING DUTY

(57) Abstract

A rolling cone bit (10) includes a cone cutter (14, 15, 16) having a pair of adjacent rows of cutter elements (70, 80) that are positioned so as to divide the sidewall (5) and bottom hole (7) duty. The wear resistance, hardness and toughness of the cutter elements (70, 80) in the adjacent rows are optimized depending upon the type of cutting the respective rows perform. In most applications, the cutter elements (70) experiencing the sidewall cutting will have cutting surfaces that are more resistant or harder than the cutting surfaces of the cutter elements (80) in the rows experiencing more bottom hole duty. Likewise, the cutter elements (80) exposed to the bottom hole duty will generally be tougher than those (70) experiencing substantial sidewall cutting. The material enhancements include varying the grades of tungsten carbide used in the cutter elements (70, 80) and by selectively employing layers of superhard abrasives, such as PCD or PCBN. The cutter elements (70, 80) may be either inserts or steel teeth.



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