



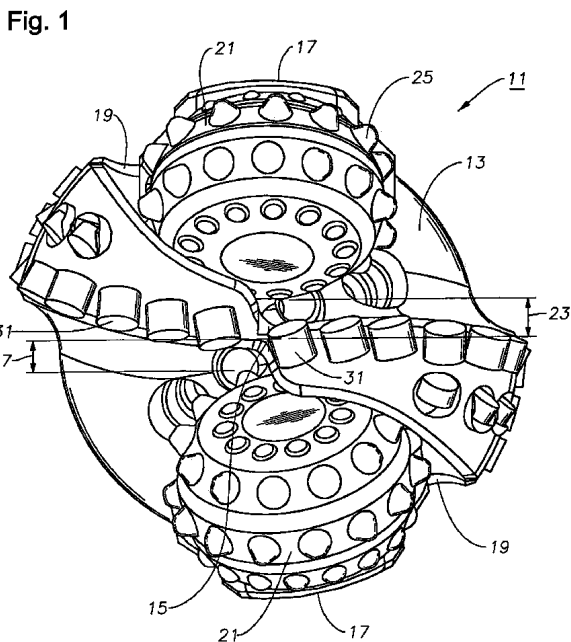
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(54) Title: MODULAR HYBRID DRILL BIT



(57) Abstract: An earth-boring bit comprising a bit body is configured at its upper end for connection into a drillstring. A fixed blade depends axially downwardly from the bit body. An axially extending slot is formed in the bit body adjacent the fixed blade. A bit leg is received and retained in the slot by engagement between the slot and correspondingly shaped bit leg, wherein the bit leg cannot be removed from the slot except by axial movement relative to the bit body. A rolling cutter is secured to the bit leg at its lower extent. A fastener secures the bit leg against movement relative to the bit body and extends through oblong apertures in the bit leg and into the bit body, wherein the bit leg can be moved axially relative to the bit body to adjust the projection of the rolling cutter relative to the fixed blade. The slot defines a pair of generally opposed sides connected by a third side, the generally opposed sides being inclined toward one another to define a dovetail that corresponds with the shape of the bit leg. The bit body further comprises a shank that is configured for connection into the drillstring at its upper extent and has a generally cylindrical receptacle formed in its lower extent; and a bit body portion having a generally cylindrical upper extent, the receptacle being and dimensioned to receive the upper extent of the bit body, wherein the shank and bit body portions are secured together by welding.



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**A. CLASSIFICATION OF SUBJECT MATTER****E21B 10/14(2006.01)i, E21B 10/62(2006.01)i, E21B 7/00(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC : E21B 10/14, E21B 10/62, E21B 7/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975  
Japanese Utility models and applications for Utility models since 1975Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKIPASS(KIPO internal) & keyword : "bit", "blade", "slot", " bit leg", "rolling cutter"**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6729418 B2 ( ROBERT H. SLAUGHTER et al. ) 04 May 2004 See figures 2-5.	1,2,4-6,8,10-12, 14,15,17-20
A		3,7,9,13,16 -----
Y	US 7096978 B2 ( MARK W. DYKSTRA et al. ) 29 August 2006 See figures 1-3, 14A and 14B.	1,2,4-6,8,10-12, 14,15,17-20
A		3,7,9,13,16 -----
A	US 2006-0196699 A1 ( ROY ESTES et al. ) 07 September 2006 See figures 1-15.	1-20
A	US 2006-0278442 A1 ( HENRY L. KRISTENSEN ) 14 December 2006 See figures 1 and 6.	1-20
A	US 5988303 A ( ROBERT W. ARFELE ) 23 November 1999 See figures 2-5.	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

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"&amp;" document member of the same patent family

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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