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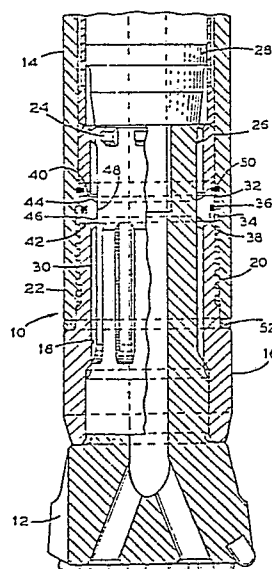
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⑤④ Bit retaining ring for recovering drill string components.

⑤⑦ A drill bit retaining ring (32) for securing a drill bit (12) to a percussion hammer (14) having a percussion piston (28). The bit (12) has a shank (18) that extends into a chuck sleeve (16, 22) which forms part of the hammer (14). The bit has a set of upper splines (24) and a set of lower splines (30) that allow the bit to move vertically within the chuck sleeve but such movement is limited when the splines abut against the retaining ring (32) which is secured within the chuck sleeve. If the drill bit (12) becomes stuck in the hole, at least the hammer and the associated drill bit can be recovered thanks to the ring according to the present invention which is designed to fracture when a sufficient outward force (i.e. a force in a direction to move the drill string out of the hole) is applied to the drill string thereby releasing the hammer from the bit. However, the ring (32) must be sufficiently strong to withstand the impact forces from the splines (24, 30) under normal operation.

FIG.1





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EUROPEAN SEARCH REPORT

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EP 88 30 3050

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y	US-A-3 945 444 (G. KNUDSON) * Column 4, lines 29-37; column 5, lines 20-68; column 6, line 24 - column 7, line 23; figure 1 *	1-3,5-8 ,10	E 21 B 17/06 E 21 B 17/07 E 21 B 4/06 // E 21 B 31/00
Y	US-A-4 445 572 (FINEBERG et al.) * Column 2, lines 19-29; column 3, lines 40-50; column 6, lines 11-35; figure 2 *	1-3,5-8 ,10	
A	DE-A-3 514 030 (HÜTTE & CO.) * Page 5, last paragraph - page 7, paragraph 1; page 8, last paragraph; figure 1 *	1	
A	US-A-3 499 664 (E. BURNS) * Column 1, line 11 - column 2, line 7; figures 3,4 *	1	
A	US-A-3 924 690 (A. SHAW) * Column 3, line 60 - column 4, line 13; figure 1 *	1,9	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	US-A-3 322 216 (G. KURT) * Column 1, line 57 - column 2, line 12 *	4	E 21 B
A	GB-A-1 472 501 (A. GIENET et al.) * Page 2, lines 24-36; figure 1 *	4	
P,A	EP-A-0 236 915 (ALSTHOM) * Abstract; figures 1,2 *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13-04-1989	Examiner RAMPELMANN K.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	