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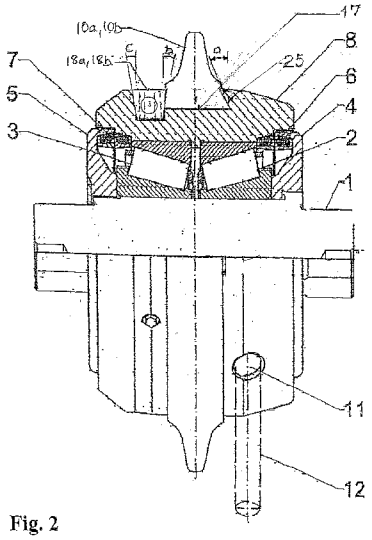


Fig. 2

(57) Abstract: A cutter is provided for shaft and/or tunnel boring which comprises a divided cutter ring (10a, 10b) and a cutter body (8) with a recess (17). The cutter ring (10a, 10b) is secured in the recess (17) by a divided clamping ring (18). The clamping ring (18) is divided into at least two segments (18a, 18b) where each segment (18a, 18b) has two segment ends, with the result that when the clamping ring (18) is tightened, a number of pairs of opposite segment ends are formed. Furthermore, in a tightened condition, all the pairs of opposite segment ends are either connected to securing elements (20), or, in a tightened condition, at least one pair of opposite segments ends is connected with a hinged device (19) while the remaining pairs of opposite segment ends are connected to securing elements (20). The segments (18a, 18b) are tightened in the segments' (18a, 18b) circumferential direction.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E21B E21D

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 982 595 A (OTT EUGENE GRAY) 28 September 1976 (1976-09-28) column 3, line 52 - column 4, line 9; figure 2 -----	1-10
Y	EP 0 631 069 A1 (AMERICAN LONGWALL FACE CONVEYO [US]) 28 December 1994 (1994-12-28) column 6, line 24 - line 36; figure 1 -----	1-10

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3982595 A	28-09-1976	AU 5824273 A	30-01-1975
		CA 986149 A1	23-03-1976
		US 3982595 A	28-09-1976
		ZA 7304345 A	29-05-1974
EP 0631069 A1	28-12-1994	AU 669784 B2	20-06-1996
		AU 6050494 A	05-01-1995
		DE 69410698 D1	09-07-1998
		DE 69410698 T2	01-10-1998
		EP 0631069 A1	28-12-1994
		US 5389044 A	14-02-1995