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(11)

EP 0 776 731 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

04.06.1997 Bulletin 1997/23(51) Int Cl.⁶: **B24B 41/06**(21) Application number: **96850061.1**(22) Date of filing: **17.04.1996**(84) Designated Contracting States:
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104 35 Stockholm (SE)(71) Applicant: **Tormek AB**
711 23 Lindesberg (SE)**(54) A grinding jig for grinding gouge chisels**

(57) A grinding jig for grinding gouges (1) with the aid of a grindstone (4) or the like and having a support (5) which can be fixed positionally in relation to the grindstone and which has a supportive part (6) that extends generally parallel with the grindstone axle. A bearing sleeve (8) is mounted on the supportive part (6) for piv-

otal movement in a plane generally perpendicular to the grindstone axle and receives a rod (9) which is displaceable in the pivotal plane of the bearing sleeve (8); and the rod (9) carries on its free end proximal to the grinding stone (4) a pivotal locking stirrup (10) which can be locked in different positions and in which the gouge (1) is firmly locked to the jig.

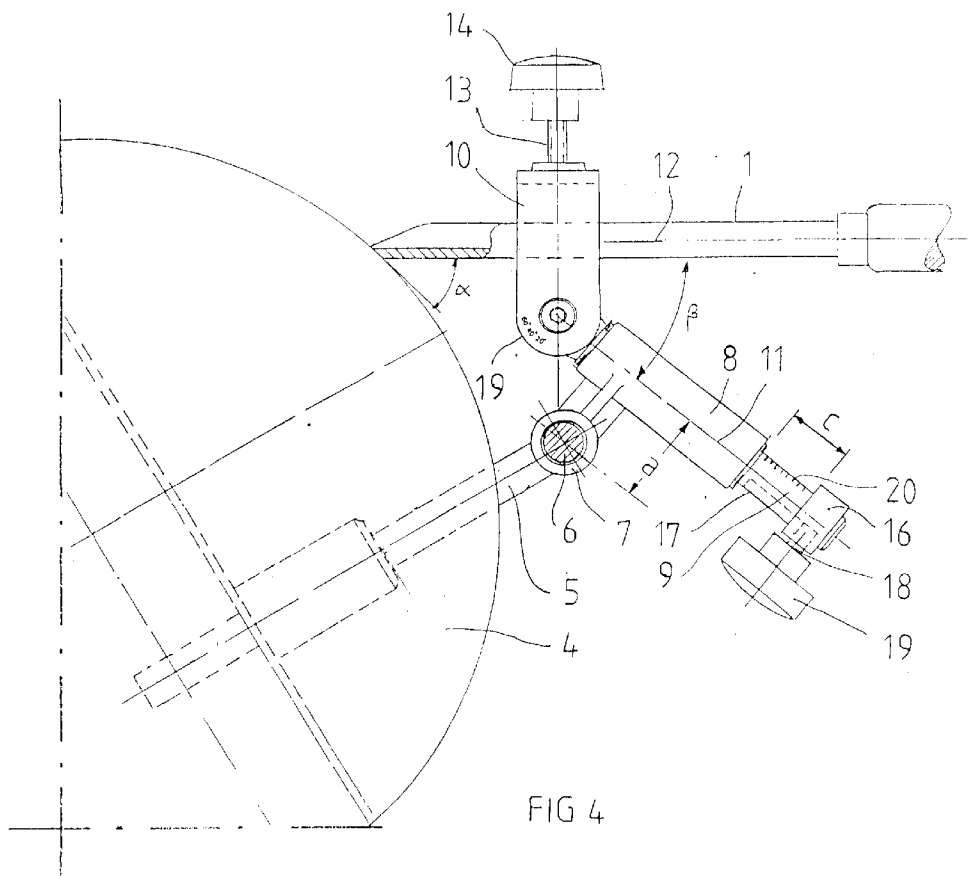


FIG 4

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Description

The present invention relates to a grinding jig for grinding gouge chisels and being of the kind defined in the preamble of Claim 1.

Finger-shaped turning gouges, firming gouges, scribing gouges, etc., are very difficult to grind. The gouges are normally ground straight when received from the supplier, and are therefore often unsuitable for the purpose intended, necessitating the user to re-grind the gouges.

The gouges are often ground in freehand, using a high-speed grinding wheel (dry grinding) or a grinding stone in water. Generally, uniform grinding of the gouges is achieved with the aid of a hand-held device, in which the gouge is clamped supported solely by one leg against the floor in front of the grindstone. It is quite impossible to finger-grind a gouge precisely and symmetrically with the aid of this tool.

An object of the present invention is to solve the problem of grinding gouges, and then particularly so-called finger-shaped turning gouges, and also to enable the bevelled surface that defines the cutting edge of the gouge a straight or a convex configuration in addition to the concave configuration afforded by the radius of the grindstone.

This object is achieved with an inventive grinding jig having the features set forth in the characterizing clauses of the following Claims.

The invention will now be described in more detail with reference to an exemplifying embodiment thereof and also with reference to the accompanying drawings, in which **Figs. 1a-c** show the tip of a gouge respectively in side view, in longitudinal sectional view, and from above, and illustrate the gouge tip in the state in which it leaves the supplier, normally ground straight; **Figs. 2a-c** illustrate the tip of a gouge that has been finger-ground in accordance with the invention, respectively from one side of the tip, in part-section and from above; **Fig. 3** is a view of the gouge profile; **Fig. 4** illustrates a grinding jig constructed in accordance with the invention; and **Fig. 5** is a front view of the jig shown in Fig. 4.

Figs. 1a-c illustrate the tip of a gouge, or turning gouge 1, in the same state as that in which it is normally delivered by the supplier. The illustrated gouge has obliquely ground surfaces 2 which define the cutting angle α of the gouge, and two surfaces 3 ground on the sides of the gouge and forming its so-called side bevels. It is often desirable to grind the gouge to a so-called finger configuration, so as to enhance its usefulness. One such finger configuration is shown in Fig. 2. In this case, the gouge is ground by rotating the gouge during the grinding process so that both obliquely ground surfaces 2 defining the gouge cutting angle, and the side bevels are produced continuously.

The invention enables a gouge to be ground in this way in a simple manner and with great precision.

Figs. 4 and 5 illustrate an inventive grinding jig for

grinding a gouge 1 to a finger configuration. Fig. 4 shows part of a grindstone 4 and a raisable and lowerable universal support 5 located adjacent the grindstone mounting. The universal support includes a part 6 which extends parallel with the grindstone axle in a known manner. A sleeve 8 which includes a journal bearing 7 is pivotally and displaceably carried by the part 6 of the universal support that extends parallel with the grindstone axle. As will be seen from Fig. 4, the journal bearing 7 is placed beneath the sleeve 8 at a distance a therefrom, so that the gouge 1 can be twisted and therewith ground at an angle of at least 180° . The sleeve 8 has mounted therein a rod 9 which can be moved in the longitudinal direction of the sleeve and which projects out from the sleeve 8 at both ends thereof. A so-called locking stirrup 10 is pivotally and lockably mounted at the end of the rod 9 that lies proximal to the grindstone. The locking stirrup 10 can thus be swung relative to the longitudinal axis 11 of the rod 9 and locked in different angular positions β in relation to the longitudinal axis 12 of the gouge 1, said gouge being firmly locked in the locking stirrup 10 by means of a screw 13. The screw 13 is provided with a knob 14 and the tip of the screw functions to press the tool lockingly against a V-block 15 of the locking stirrup 10, in a positive manner.

The end of the rod 9 that lies distal from the grindstone 4 is provided with a stop ring 16 which can be moved axially along said rod end. The rod 9 also includes an axially delimited groove 17 into which the end of a screw 18 screwed into the stop ring 16 extends. The screw 18 is conveniently integral with a knob 19, and functions to enable the locking ring 16 to be locked in different positions along the rod 9.

The manner in which grinding of a gouge is achieved with the aid of the inventive jig will be readily apparent from Figs. 4 and 5. The cutting angle α is determined by the extent to which the gouge projects from the locking stirrup and by the distance of the part 6 of said universal support 5 from the grindstone. A side bevel corresponding to the side bevel shown in Figs. 2a-c is obtained by twisting the locking stirrup and tool 1 around the longitudinal axis of the rod 9. The configuration of the side bevel - finger ground - i.e., its length d (see Fig. 2c) is determined by the angle β between the tool and the longitudinal axis 11. A suitable angle β is 20° , wherein the jig may be graduated or likewise marked for larger and smaller angles around this value, as indicated at 19 in Figs. 4 and 5. A smaller angle will result in a shorter side bevel, whereas a larger angle will result in a longer side bevel. The side bevel will be concave in shape and will have a radius corresponding to the radius of the grindstone. However, the inventive jig can be reset quickly to obtain a straight or a convex side bevel. A convex side bevel may be desired, for instance, by lathe operators in respect of certain lathe-cutting work. Resetting of the jig is effected by first grinding the gouge with the stop ring 16 locked in a position nearest the sleeve 8. By then moving the stop ring away from

the sleeve 8, e.g. through a distance of 10-15 mm, the locking stirrup 10, with the gouge 1, can be moved in a direction towards the grindstone and the heel 21 of the cutting edge (see Fig. 2) will be ground so as to obtain the desired convex side bevel. The front edge of the cutting edge can be ground at the same time without changing the jig setting, by allowing the jig to move away from the grindstone, which takes place automatically by virtue of rotation of the grindstone. Thus, it is possible to grind the front edge of the cutting edge and the heel of the cutting edge in one and the same jig setting, thereby obtaining a more or less convex side bevel or obliquely ground surface 2, the degree of convexity being determined by the distance c set by means of the stop ring 16. The rod 9, for instance, may be provided with graduations to facilitate rod adjustment.

In the case of the illustrated embodiment, the locking stirrup 10 is locked to the rod 9 by means of a Philip's screw and nut, although it will be understood that other fastener means may be used, for instance a knob-carrying screw. Neither need the rod 9 be smooth as in the case of the Figs. 4 and 5 embodiment, but may be provided with screw threads which mesh with screw threads in the bearing sleeve 8 for axial movement of the rod 9 in said sleeve, and the stop 16 may be a knob screwed onto the rod 9.

that the stop means (16) has the form of an abutment in the form of a knob screwed onto the rod (9).

- 5 5. A jig according to Claim 1, 2, 3 or 4, **characterized** in that the rod (9) and the locking stirrup (10) are provided with mutually coacting graduations (19) for enabling the angle (α) between the rod (9) and the locking stirrup (10) to be read-off.
- 10 6. A jig according to any one of the preceding Claims, **characterized** in that the end of the rod (9) that lies distal from the locking stirrup (10) is graduated (20) so as to enable the position of the rod (9) in the bearing sleeve (8) to be determined.

Claims

- 30 1. A grinding jig for grinding gouges (1) with the aid of a grindstone (4) or the like and having a support (5) which can be fixed positionally in relation to the grindstone and which has a supportive part (6) that extends generally parallel with the grindstone axle, **characterized** in that the jig includes a bearing sleeve (8) which is mounted on the supportive part (6) for pivotal movement in a plane generally perpendicular to the grindstone axle and receives a rod (9) which is displaceable in the pivotal plane of the bearing sleeve (8); and in that the rod (9) carries on its free end proximal to the grinding stone (4) a pivotal locking stirrup (10) which can be locked in different positions and in which the gouge (1) is firmly locked to the jig.
- 35 2. A jig according to Claim 1, **characterized** in that the other, free end of the rod (9) distal from the locking stirrup (10) carries a stop means (16) which can be moved along the rod.
- 40 3. A jig according to Claim 2, **characterized** in that the stop means has the form of a stop ring (16) that can be locked in selected positions along the rod (9).
- 45 4. A jig according to Claim 2 or Claim 3, **characterized** in that the rod (9) is screw-threaded in the bearing sleeve (8) for movement of said rod therein; and in

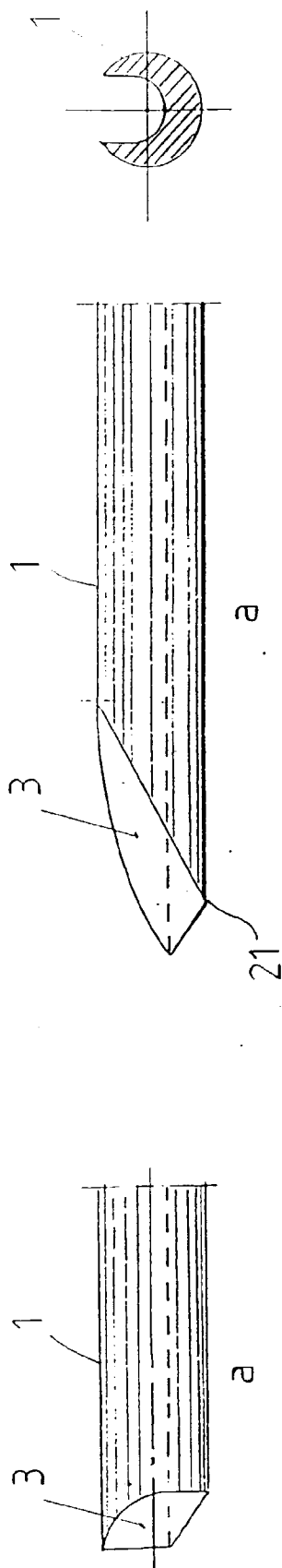


FIG 1

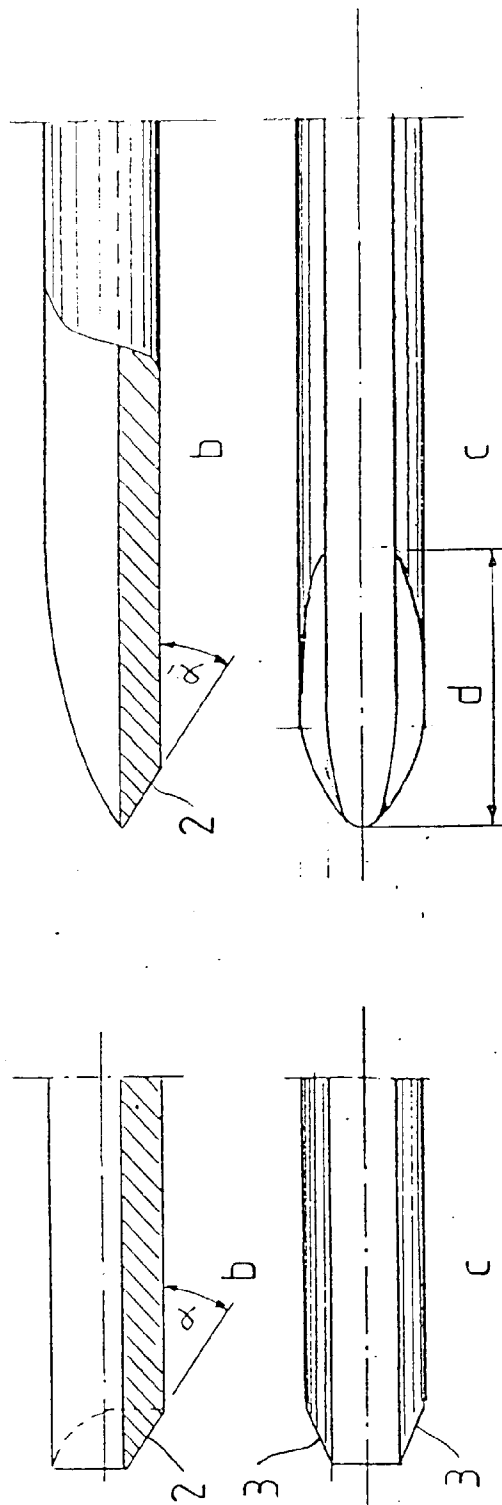
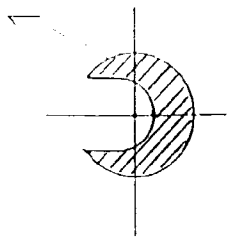
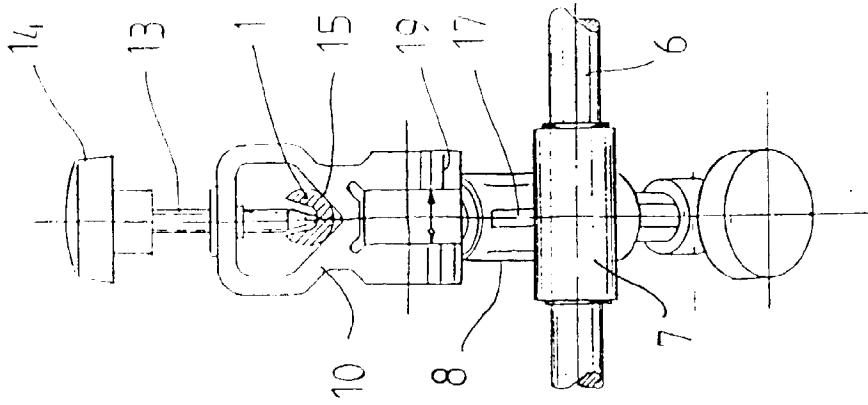


FIG 2

FIG 3





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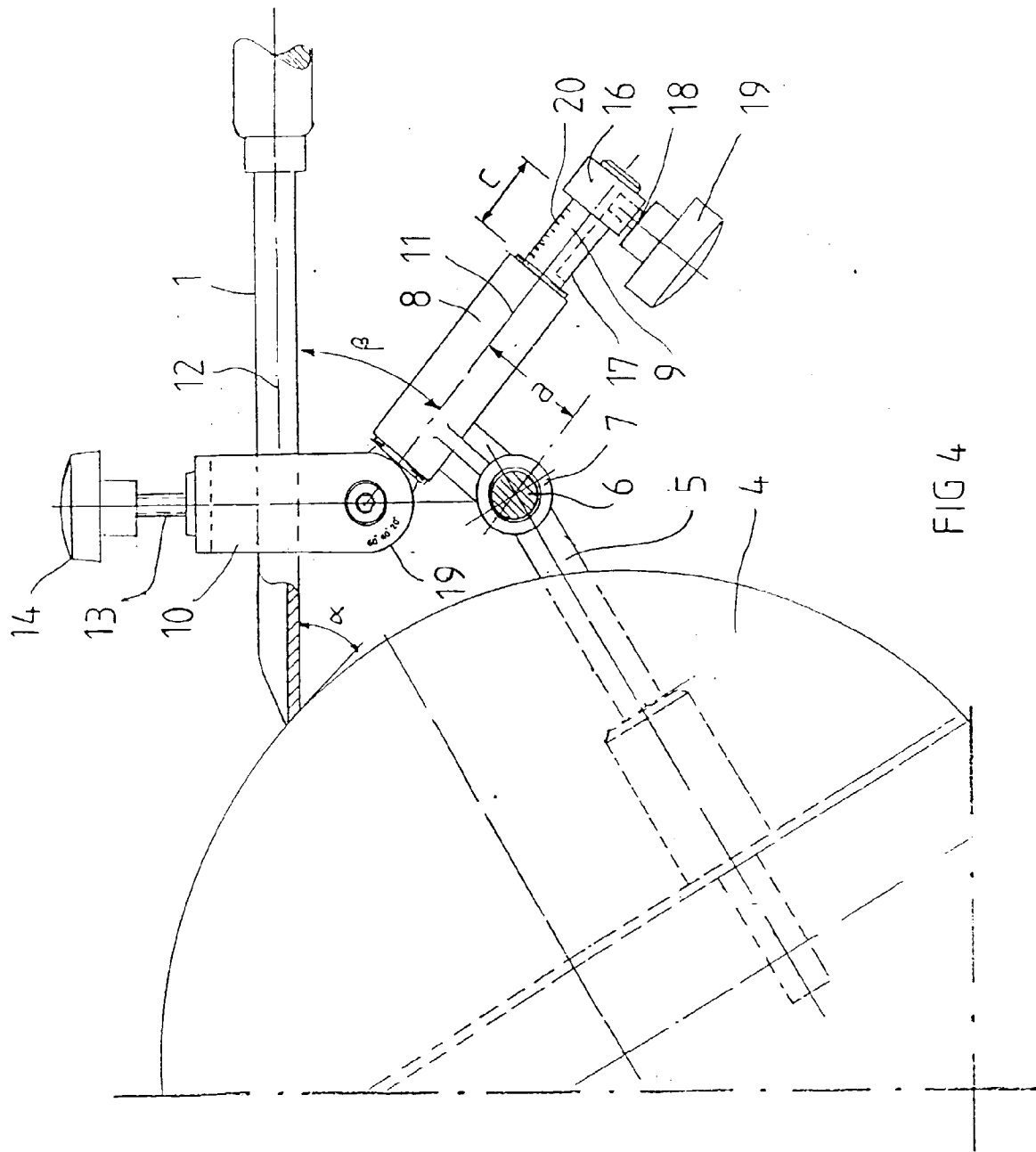


FIG 4



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EUROPEAN SEARCH REPORT

Application Number
EP 96 85 0061

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.6)
X A	US 2 107 921 A (W.A. WEED) * page 2, line 63 - page 3, line 53; figures 1-11 *	1 2-6	B24B41/06
A	GB 2 278 560 A (RICHARD PETER SCOTT) * abstract; figures 1A-1C *	1-6	
A	GB 2 278 305 A (MICHAEL O'DONNELL) * page 4, line 1 - page 2, line 35; figure 1 *	1-6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) B24B
Place of search		Date of completion of the search	Examiner
BERLIN		25 February 1997	Cuny, J-M
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