July 4, 1944. W. P. DETTLOFF 2,352,888

KEYWAY GRINDING TOOL

Filed Feb. 9, 1944 2 Sheets-Sheet 1

Fig. 1.

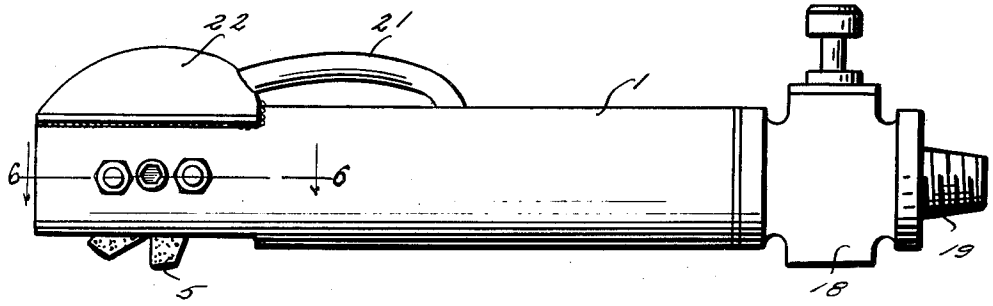


Fig. 2.

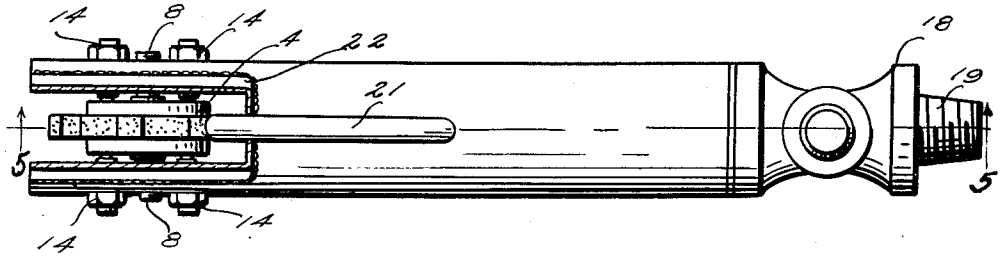


Fig. 3.

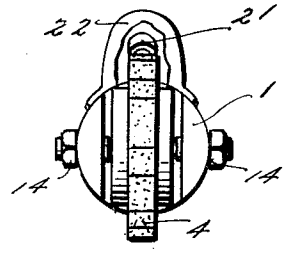
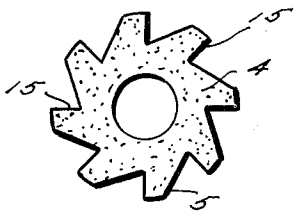


Fig. 4.



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Filed Feb. 9, 1944 2 Sheets-Sheet 2

Fig. 5.

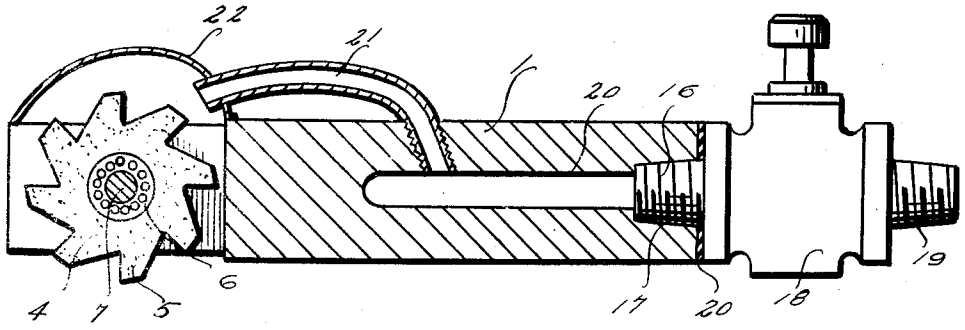


Fig. 6.

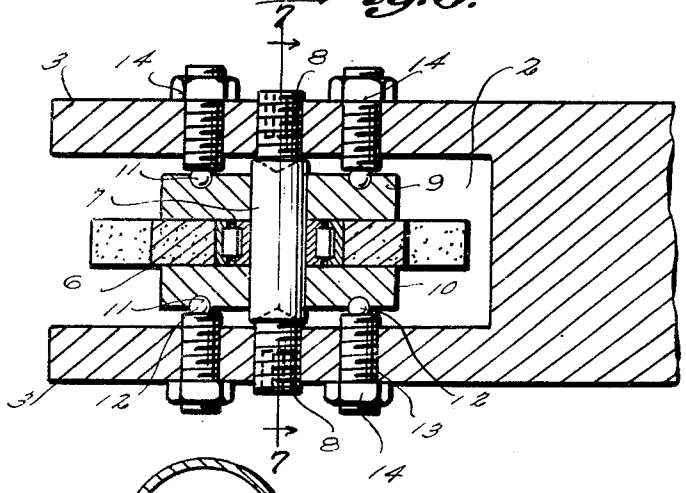
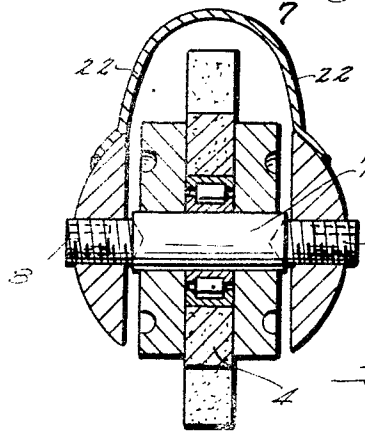


Fig. 7.



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KEYWAY GRINDING TOOL

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Application February 9, 1944, Serial No. 521,674

3 Claims. (Cl. 51—170)

My invention relates to improvements in keyway grinding tools for use especially in forming keyway slots in such parts as milling machine cutters, gears, collars, and the like.

The usual practice in forming keyway slots in such parts involves grinding the same with a hand tool and is both laborious and time-consuming.

The principal object of my invention is to provide a pneumatically operated tool adapted for use in a lathe, or the like, and for grinding keyway slots in a fraction of the time required to form the same with the use of a hand tool, and more accurately, at the same time obviating manual labor in the operation as far as possible.

Other and subordinate objects are also comprehended by my invention, all of which, together with the precise nature of my improvements, will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in side elevation of my improved keyway grinding tool, in its preferred embodiment,

Figure 2 is a view in plan,

Figure 3 is a view in front end elevation,

Figure 4 is a view in side elevation of the grinding or abrading wheel detached,

Figure 5 is a view in longitudinal section taken on the line 5—5 of Figure 2,

Figure 6 is a fragmentary view in horizontal section taken on the line 6—6 of Figure 1 and drawn to an enlarged scale, and

Figure 7 is a view in transverse section taken on the line 7—7 of Figure 6.

Referring to the drawings by numerals, my improved keyway grinding tool, as illustrated, comprises a substantially cylindrical shank 1 provided with a bifurcated front end 2 forming a pair of parallel, laterally spaced side cheek members 3 serving a purpose presently seen.

Intermediate the cheek members 3 is a toothed grinding wheel 4, the teeth 5 of which extend above and below the cheek members 3. A roller bearing unit 6 is suitably fixed and centered in the wheel 4. A pin 7 extends through the roller bearing unit 6 and forms an axis member for said wheel and bearing unit with a slight clearance between its ends and the cheek members 3. Allen-type screws 8 extended through the cheek members 3 against the ends of the pin 7 clamp said pin therebetween. A pair of fixed metal washers 9, 10 are fitted on the pin 7 against opposite sides of the wheel 4. Each washer 9, 10 is provided in its outer side face with a concentric groove having a ball bearing raceway 11. A pair of ball bearings 12 is partially seated in each raceway 11 upon diametrically opposite sides of the raceway and in the horizontal plane of the wheel 4. Allen set screws 13 extended through the cheek members in pairs with inner socketed ends bearing against pairs of ball bearings 12 retain said ball bearings in the raceways. Lock nuts 14 on the outer ends of the Allen set screws 13 prevent said screws from working loose. As will be clear, the set screws 13 may be adjusted against the ball bearings 12 and the latter against the washers 9, 10 to center the roller bearing unit 6 and the wheel 4 between the cheek members 3 and thus prevent lateral play of said bearing unit and wheel.

The grinding wheel 4 is designed to be driven by a column of air under pressure impinging against the rear faces of the teeth 5 at the top of said wheel and said wheel is therefore provided with teeth having radial flat rear faces 15. For directing the column of air against said teeth, the following means are provided:

At the rear end thereof, the shank 1 is provided with an internally threaded axial socket 16 in which is turned a threaded nipple 17 on one end of a conventional plug-type valve 18 having a similar nipple 19 on its other end for the attachment thereto of an air line, not shown, leading from a suitable source of air under pressure. A suitable gasket 20 is interposed between the valve 18 and the rear end of the shank 1. An axial counterbore 21 extends from the socket 17 into the shank 1 for a suitable distance and communicates adjacent its inner end with the rear end of a tubular air discharge nozzle 21' extending upwardly out of the shank 1 and courving forwardly and downwardly to dispose its front end in a position to direct a column of air issuing therefrom against the rear face 15 of the wheel 5 successively at the top of said wheel so that the latter will be driven counterclockwise, as viewed in Figures 1 and 5. As suitably arched hood 22 bridges the space between the cheek members 3 and closes said space above the wheel 4, the front end of the nozzle 21 being suitably extended into said hood. The hood 22 may be welded, as as 23, to said cheek members 3.

The described tool is inserted in any standard type boring bar holder and then fastened to the tool post of a lathe. As the pair pressure is turned on, under control of the valve 18, the grinding wheel 4 is reciprocated back and forth

by a handwheel on the carriage of the lathe to form a keyway slot in a selected part which may be held stationary in the lathe chuck.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation.

Manifestly, the invention, as described, is susceptible of modification without imparting from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.

What I claim is:

1. In a tool of the class described, a shank, a toothed wheel of abrasive material rotatably mounted on one end of the shank, an air valve mounted on the other end of the shank and adapted to be connected to a supply source of air under pressure, a conduit extending axially into said shank part way from said air valve for receiving air from said valve, and an air nozzle extending from said conduit laterally out of the shank and terminating in the plane of said wheel for directing a jet of air under pressure against the teeth of the wheel to rotate said wheel.

2. In a tool of the class described, a shank, a toothed wheel of abrasive material rotatably mounted on one end of the shank, an air valve mounted on the other end of the shank and adapted to be connected to a supply source of air under pressure, a conduit extending axially into said shank part way from said air valve for receiving air from said valve, an air nozzle extending from said conduit laterally out of the shank and terminating in the plane of said wheel for directing a jet of air under pressure against the teeth of the wheel to rotate said wheel, and a hood mounted on said one end of the shank to cover the teeth of the wheel in the line of said jet, said nozzle extending into said hood.

3. In a tool of the class described, a shank, a toothed wheel of abrasive material rotatably mounted on one end of the shank, an air valve mounted on the other end of the shank and adapted to be connected to a supply source of air under pressure, a conduit extending axially into said shank part way from said air valve for receiving air from said valve, and an air nozzle extending from said conduit laterally out of the shank and terminating in the plane of said wheel for directing a jet of air under pressure against the teeth of the wheel to rotate said wheel, said mounting comprising side cheek members on said one end of the shank, a pin extending between said members, a roller bearing on said pin supporting said wheel, and means to center the wheel on said bearing comprising anti-friction members at opposite sides of the wheel, and devices for adjusting said anti-friction members laterally of the wheel.

WILLIAM P. DETTLOFF.