

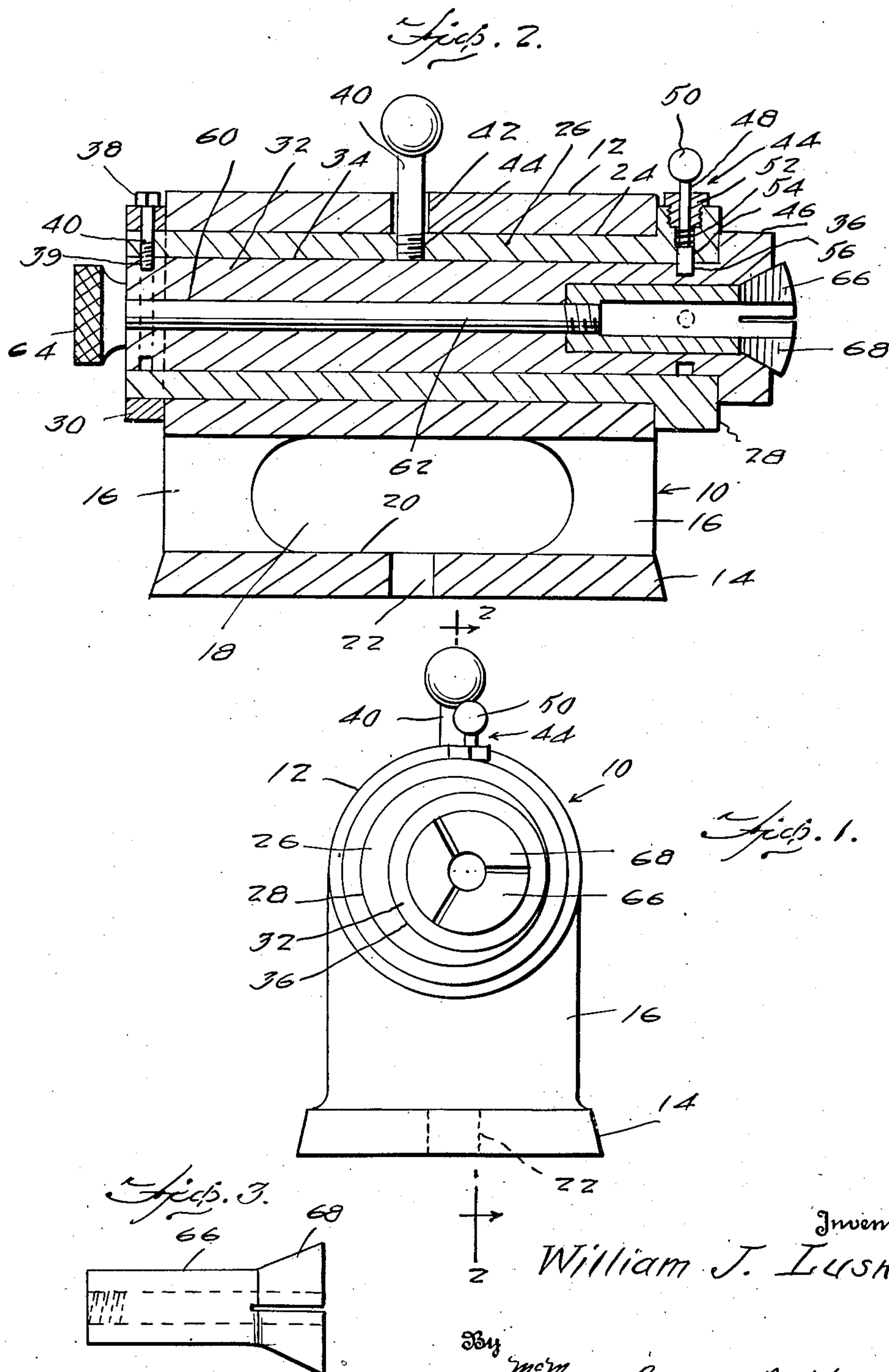
Oct. 25, 1949.

W. J. LUSK

2,486,044

TAP GRINDING FIXTURE

Filed Aug. 22, 1947



UNITED STATES PATENT OFFICE

2,486,044

TAP GRINDING FIXTURE

William J. Lusk, Berea, Ohio

Application August 22, 1947, Serial No. 770,121

2 Claims. (Cl. 51—234)

1

This invention relates to grinding machines and to fixtures adapted for supporting taps and similar devices during the grinding operation.

An object of the invention is to provide a tap grinding fixture which is adapted to support a tap in position to be operated upon by a grinding wheel and the like.

Another object of the invention is to provide a tap grinding fixture adapted to reclaim dull or broken taps by cutting off the end and regrinding with the proper lead and taper.

A further object of the invention is to provide a tap grinding fixture incorporating easily adjustable means for regrinding taps with two or four flutes as the case may be.

Still another object of the invention is to provide a tap grinding fixture which is simple in design, inexpensive to manufacture, and which is effective in operation and quickly and easily adjustable for the grinding operation, and then easily releasable for removing the tap thereafter.

Other objects and advantages of the invention will become apparent from the following description of a preferred embodiment thereof as illustrated in the accompanying drawing, and in which:

Figure 1 is a right end elevation of the device shown in Figure 1.

Figure 2 is a longitudinal sectional elevation of my improved tap grinding fixture, taken on line 2—2 of Figure 1.

Figure 3 is an elevational detail view of the tap gripping collet employed in the device, shown separately.

In the regrinding of broken or worn taps, it is necessary to support the tap firmly with relation to the regrinding wheel, and to cause the tap to turn through the requisite angle as it is traversed by the grinding wheel in order to grind the spiral flutes therein, two or four flutes being ground in as the case may be. The present application discloses means for accomplishing this easily and efficiently.

In order to understand clearly the nature of the invention and the best means for carrying it out, reference may now be had to the drawings, in which like numerals denote similar parts throughout the several views.

As shown, there is a fixture body indicated generally at 10 and including a hollow cylindrical housing 12 supported upon a base 14 by upright leg-like members 16, all formed or cast as an integral unit. An opening 18 is thus formed in the space between the leg members 16, affording access to the middle portion of the flat top sur-

2

face 20, thus permitting a single bolt to be inserted through the vertical bore 22 in the base for single bolt mounting thereof.

The base of the fixture thus clamps securely to the grinding table in position for cooperation with the grinding wheel usually also carried thereby. A longitudinal bore 24 is formed in the cylindrical housing 12 to receive the outer cylindrical sleeve 26, the sleeve being thus turnable about its axis within the housing bore. The outer sleeve 26 is provided at one end with an annular integral collar or flange 28 one radial wall of which abuts against the outer end of the cylindrical housing 12.

An annular retaining collar 30 encircles the opposite end of the outer sleeve 26, thus serving to retain the outer sleeve in position against displacement from the bore 24. An eccentric longitudinal bore 34 is formed in the outer sleeve 26, its eccentricity being best shown in Figure 1, to receive an inner sleeve 32 which is similarly provided with an outer flange 36 abutting against the end surface of the outer sleeve 26.

As seen best in Figure 2, the inner sleeve 32 extends wholly through the outer sleeve 26, their left hand ends being co-extensive and secured together by means of a set screw 38 extending through a radial bore 40 formed through the overlying outer sleeve and collar 30 the inner end of the screw extending into the annular groove 39.

The rotary travel of the outer sleeve 26 is controlled by a radial handle 40 the shank of which extends through an arcuate motion limiting slot 42 formed in the housing 12, the inner end of the handle shank being threaded into a radial bore 44 formed in the sleeve 26. The outer sleeve also has a positioning pin assembly indicated generally at 44. The assembly 44 is disposed in a radial bore 46 formed in the flange 28 of the outer sleeve, and includes a plunger shaft 48 the outer end of which has an integral knob 50 and the inner portion of which extends through the radial bore 46, being almost as large in diameter as the bore 46 at its inner end.

The reduced shank of the shaft 48 extends slidably through the axial bore in a nut or plug 52 which is threaded into the enlarged outer end of the radial bore 46. A spring 54 encircles the inner portion of the shank of the shaft 48 between the enlarged plunger portion thereof and the nut 52, thus biasing the plunger portion of the shaft 48 radially inwards toward the outer surface of the inner sleeve 32. Under this biasing influence, the positioning plunger 48 is thus

pressed into any selected one of four radial recesses 56 which are formed in the outer surface of the inner sleeve 32, and are spaced from each other by ninety degrees.

The positioning knob 50 is pulled radially outward and the parts turned to bring the bore 46 into registry with any selected positioning recess 56, the knob 50 then being released to allow the spring to press the plunger into the underlying recess 56. The set screw 38 is then tightened so its inner end presses firmly into the annular turned groove 39, holding the parts securely in position.

The inner sleeve 32 has an axial bore 60 extending longitudinally therethrough to receive a collet tightening shaft or draw bar 62 to the outer left hand end of which is secured a turning knob 64 whereby the shaft may be turned. The right hand end of the axial bore 60 is enlarged to receive the shank of a collet 66 having jaws 68 adapted to receive therebetween the shank of a tap to be ground. It will be seen that the right hand end of the shaft 62 is threaded into the left hand end of the collet shank so that upon turning the knob 64 the collet is drawn in a leftward direction to press its gripping jaws toward each other under the camming influence of the cam surfaces 68 of the collet. The tap is thus held securely in the collet in this manner.

To use the fixture, the tap to be ground is inserted in the collet 66 and tightened by means of the draw bar 62. Thereafter the position pin 48 is used to position the tap for either two or four flutes as the case may be, and the handle 40 is turned within the limits of the slot 42 each time the tap is positioned by pin 48, the grinding wheel thus operating upon selected flutes on the tap.

Although I have described a preferred embodiment of my invention in specific terms, it is to be understood that various changes may be made in size, shape, materials and arrangement without departing from the spirit and scope of the invention as claimed.

I claim:

1. A workholder for supporting a workpiece for limited eccentric rocking movement about a longitudinal axis, said workholder comprising a base, said base having a longitudinal tubular housing having a concentric bore, an outer tubular cylinder rotatably fitting said concentric bore, said outer cylinder having a bore parallel to but eccentric with respect to said concentric bore, an inner cylinder rotatably fitting said eccentric bore, means preventing sidewise movement of said outer and inner cylinders and said housing relative to each other, a workpiece clamping collet arranged to project axially from one end of said inner cylinder, indexing means operating between

said outer and inner cylinders for releasably holding said inner cylinder in any one of a number of different predetermined positions of rotation of said inner cylinder relative to said outer cylinder, and handle means on said outer cylinder arranged for rotating said outer cylinder relative to said cylindrical housing, said positions of rotation of said inner cylinder relative to said outer cylinder being equally circumferentially spaced from each other, and means on said cylindrical housing limiting the swing of said handle means in either direction to a circumferential distance equal to the distance between adjacent ones of said positions of rotation.

2. A workholder for supporting a workpiece for limited eccentric rocking movement about a longitudinal axis, said workholder comprising a base, said base having a longitudinal tubular housing having a concentric bore, an outer tubular cylinder rotatably fitting said concentric bore, said outer cylinder having a bore parallel to but eccentric with respect to said concentric bore, an inner cylinder rotatably fitting said eccentric bore, means preventing sidewise movement of said outer and inner cylinders and said housing relative to each other, a workpiece clamping collet arranged to project axially from one end of said inner cylinder, indexing means operating between said outer and inner cylinders for releasably holding said inner cylinder in any one of a number of different predetermined positions of rotation of said inner cylinder relative to said outer cylinder, and handle means on said outer cylinder arranged for rotating said outer cylinder relative to said cylindrical housing, said positions of rotation being equally circumferentially spaced, said handle comprising a radial arm fixed to project from said outer cylinder, said cylindrical housing being formed with a circumferentially extending slot passing said arm and of a length to limit the swing of said handle arm in either direction to a distance equal to the distance between any two adjacent positions of rotation of said inner cylinder.

WILLIAM J. LUSK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
966,731	Brinkman	Aug. 9, 1910
1,981,174	Hille	Nov. 20, 1934
2,358,241	Moody	Sept. 12, 1944
2,413,436	Dawson	Dec. 31, 1946