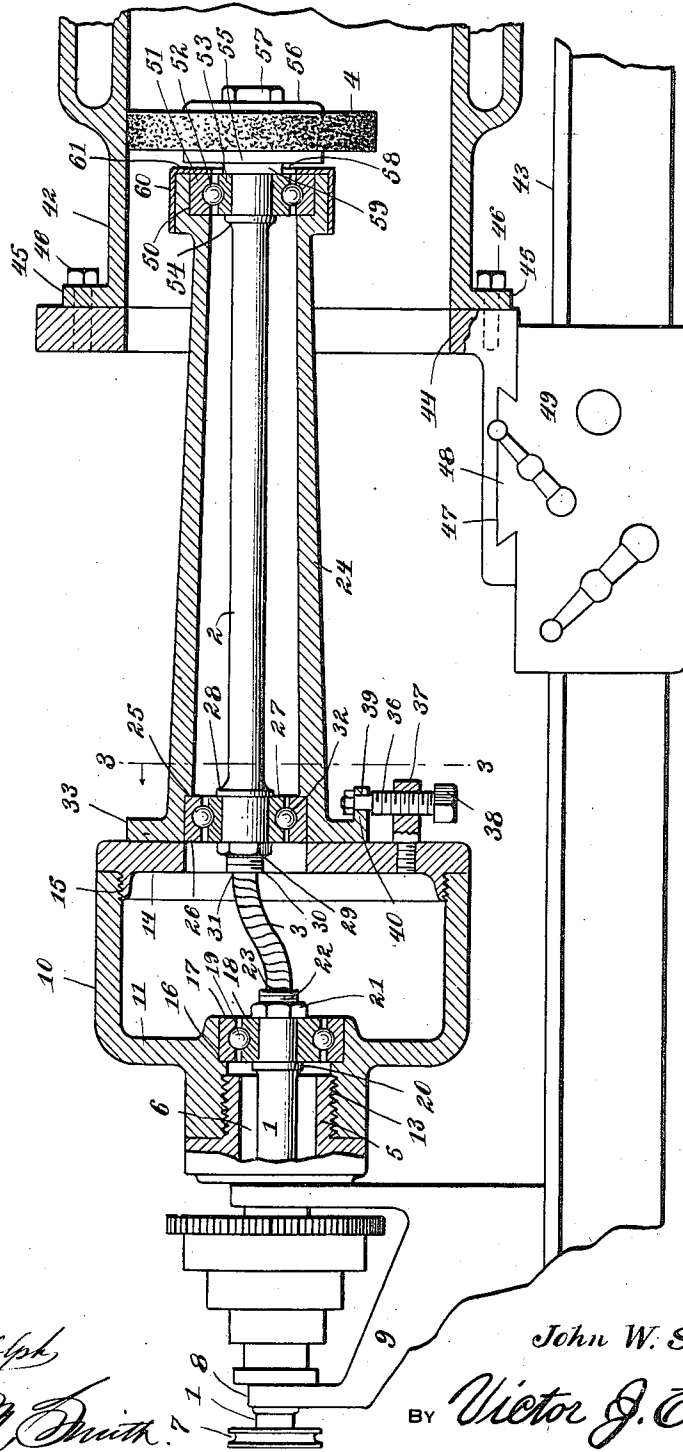


J. W. SINGER.
CYLINDER GRINDER.
APPLICATION FILED OCT. 12, 1917.

1,260,080.

Patented Mar. 19, 1918.
2 SHEETS—SHEET 1.

Fig. 1



WITNESSES

G. F. Wadsworth

R. M. Smith

INVENTOR

John W. Singer,

BY *Victor J. Evans*

ATTORNEY

J. W. SINGER.
CYLINDER GRINDER.
APPLICATION FILED OCT. 12, 1917.

1,260,080.

Patented Mar. 19, 1918.
2 SHEETS—SHEET 2.

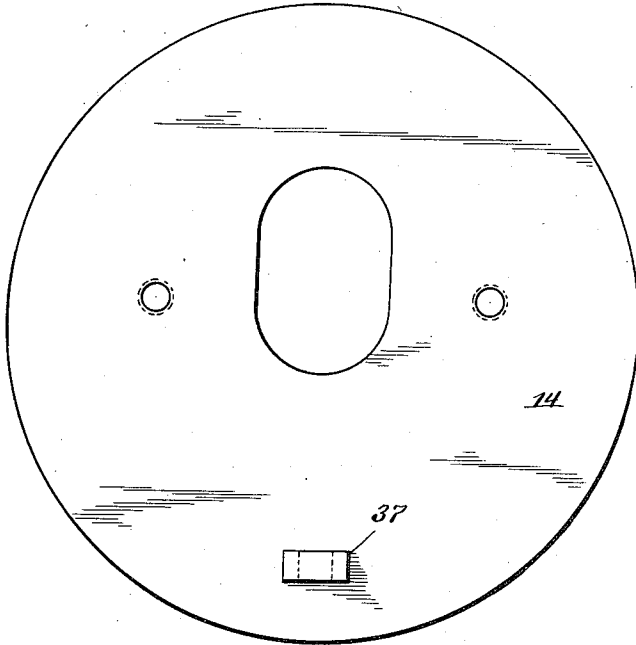


Fig. 2

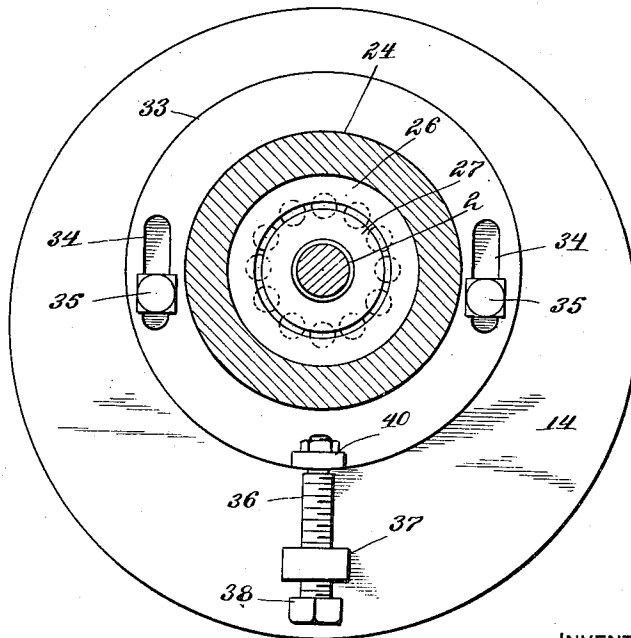


Fig. 3

WITNESSES

W. F. Woodruff,

R. M. Smith.

INVENTOR

John W. Singer,

By *Victor J. Evans*

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN W. SINGER, OF CALEXICO, CALIFORNIA.

CYLINDER-GRINDER.

1,260,080.

Specification of Letters Patent.

Patented Mar. 19, 1918.

Application filed October 12, 1917. Serial No. 196,237.

To all whom it may concern:

Be it known that I, JOHN W. SINGER, a citizen of the United States, residing at Calexico, in the county of Imperial and State of California, have invented new and useful Improvements in Cylinder-Grinders, of which the following is a specification.

This invention relates to cylinder grinders, the same being in the form of an attachment for a lathe.

The object of the invention is to provide a lathe attachment of the general character referred to adapted to be used in conjunction with a lathe having a hollow spindle upon which the device of this invention is capable of being mounted, the device embodying a housing member for a section of the driving shaft or spindle for the grinding element, a tubular housing for another portion of said driving shaft or spindle, and means for adjusting or varying the distance between the centers of the initial and final sections of the driving shaft or spindle in accordance with the internal diameter of the cylinder operated upon.

The chief feature of the invention resides in the particular relation of the housings above referred to and the formation of the housing which incloses the intermediate portion of the driving shaft or spindle, enabling the housings to be separated from each other to give access to the contained working parts.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement of parts, herein fully described, illustrated and claimed.

In the accompanying drawings:—

Figure 1 is a view partly in elevation and partly in section, illustrating the improved cylinder grinding attachment in its applied relation to a lathe.

Fig. 2 is an inner end view of the tubular housing.

Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

The cylinder grinding attachment for lathes contemplated in this invention comprises what may be termed a tumbling shaft or spindle, the latter comprising a primary or initial section 1, a final or terminal section 2, and an intermediate section 3 which serves as a transmission element between the

sections 1 and 2 which, when in working position, have their longitudinal axes out of line with each other. The terminal section 2 has mounted fast thereon but detachable therefrom a grinding wheel 4. The initial section 1 extends through the live spindle 5 of the lathe, which live spindle is of hollow or tubular formation being formed with a central longitudinal bore 6. On the outer end of the section 1 of the driving shaft or spindle there is a belt receiving pulley 7 adapted to receive a belt from any suitable motor arranged in any suitable way and relation to the lathe. 8 designates a radial ball bearing which receives the initial section 1 of the driving shaft or spindle.

The intermediate section 3 of the driving shaft or spindle is contained within a relatively large cylindrical housing 10 closed at one end by a head 11 having an internally threaded hub which is adapted to be screwed upon the externally threaded portion 13 of the live spindle 5, thus adapting the attachment to be placed upon and removed from the lathe. The opposite side of the housing 10 is normally closed by another head or plate 14 having a screw threaded engagement therewith as shown at 15 whereby the head 14 may be detached from the casing 10 to give access to the parts contained therein. The hub is formed with an annular internal rabbet 16 to receive a stationary ball race 17 within which is a ball bearing collar 18 fast on the section 1 of the driving shaft or spindle, balls 19 being interposed between the race 17 and the collar 18. The collar 18 is confined between an annular shoulder 20 on the section 1 of the shaft or spindle and a coupling member 21 which is internally threaded and screwed upon the inner end portion of the spindle section 1 as indicated at 22. The coupling member 21 is formed with a socket 23 to receive the adjacent end of the intermediate section 3 of the driving shaft or spindle, said section 3 being preferably flexible or consisting of what is known as a flexible shaft.

Adjustably secured to the detachable head 14 of the housing 10 is a tubular arm or housing 24 which is preferably made tapering toward its outer extremity as shown and which contains the final or terminal section 2 of the driving shaft or spindle. Adjacent

to its inner end the tubular arm or housing 24 is formed with a rabbet 25 to receive a ball race 26 which surrounds a ball bearing collar 27 fast on the section 2 of the shaft or spindle and confined between an annular shoulder 28 thereof and a second shaft coupling 29 which is threaded upon the section 2 as shown at 30 and formed with a socket 31 to receive the adjacent end of the flexible shaft section 3. Anti-friction balls 32 run between the ball race 26 and the collar 27.

The tubular arm or housing 24 is formed at its inner end with an enlarged circumferential flange 33 and, as shown in Fig. 2, said flange is formed at about diametrically opposite points with slots 34 to receive fastening means such as cap screws 35 which provide for fixing the adjustment of the tubular arm or housing 24. The means for adjusting said tubular arm or housing 24 consists of an adjusting screw 36 which is threaded through a lug or projection 37 extending from the detachable head 14 of the housing 10. The screw 36 is provided at its outer end with a suitable head 38 and the opposite end thereof is reduced and a portion thereof unthreaded or left smooth to form a journal 39 which is freely rotatable in a lug 40 projecting from the flange 33. The extreme inner end portion of the screw 36 is smooth where it passes through the lug 40 and has shoulders as shown to prevent it from moving longitudinally, allowing it to merely rotate in the lug 40. To adjust the tubular arm or housing 24, the fastening screws 35 are loosened, after which the adjusting screw 36 is turned in the proper direction to increase or decrease the distance between the longitudinal centers of the shaft sections 1 and 2 in accordance with the internal diameter of the cylinder to be ground, such a cylinder being shown at 42. The cylinder 42 is supported above the bed 43 of the lathe by means of an L-shaped supporting member or holder 44 to which the cylinder flange 45 is fastened by a cap screw 46 or the equivalent thereof. The supporting member 44 is formed in the under side thereof with a dove-tailed recess 47 to fit the correspondingly shaped projection 48 on the upper side of the ordinary screw feed tool rest 49 which traverses and is actuated along the bed 43 by the usual feed screw mechanism which operates simultaneously with the rotation of the live spindle of the lathe.

At its outer end, the tubular arm or housing 24 is enlarged and formed with an internal annular rabbet 50 in which is fitted a ball race 51 containing anti-friction balls 52 which travel around a ball collar 53 clamped on the shaft section 2 between an annular shoulder 54 thereof and the inner clamping disk 55 of the grinding wheel 4, another clamping disk 56 being located at the opposite or outer side of the wheel 4 and

the parts being all securely clamped in place by means of a nut 57. The inner disk 55 is formed with an annular rabbet 58 leaving a disk-like projecting central portion 59 which lies in the central opening of a dirt guard 60, said guard having the inwardly extending flange 61 which fits snugly within the rabbet 58 and thereby serves to exclude foreign matter and prevent the same from obtaining access to the bearings and working parts within the housings 10 and 20.

From the foregoing description taken in connection with the accompanying drawings it will now be seen that the tubular arm or housing 24 may be adjusted in relation to the head 14 of the housing 10 until the desired distance is obtained between the centers of the shaft sections 1 and 2 in accordance with the internal diameter of the cylinder being ground. When the desired adjustment is obtained, it is fixed and rendered permanent by tightening the cap screws 35. Whenever necessary, the housing or tubular arm 24 may be disconnected from the head 14 of the housing 10, or, the head 14 may be unscrewed and detached from the body of the housing 10. The screw threaded connection between the housing 10 and the live spindle of the lathe insures against the admission of foreign matter at that point of the two housings, while the guard 60 excludes foreign matter at the outer end of the tubular arm or housing. This is a very important feature in order to prevent the grit and fine particles of metal in the cylinder being ground from obtaining access to the bearings and other working parts of the device. Furthermore the construction described admits of the easy assemblage and disassociation of the several working parts of the mechanism as well as the housing elements therefor.

I claim:—

A cylinder grinding attachment for hollow spindle lathes, comprising a grinding wheel, a driving shaft for said wheel embodying initial final and intermediate sections, the initial section being insertible through the hollow live spindle of the lathe, a cylindrical housing for the intermediate shaft section having an internally threaded extension adapting it to be screwed upon the threaded portion of the live spindle and also embodying a detachable head, a tubular housing arm having at one end an enlarged flange formed with a plurality of slots, fastening means passing through said slots and engaging the detachable head of the aforesaid housing and adapted to permit said arm to be adjusted diametrically of the aforesaid housing, an adjusting screw having a threaded connection with said detachable head and journaled in a projection on said flange, an annular dirt guard surrounding the unsupported end of said tubular arm

and having a portion interposed between the grinding wheel and the extremity of said arm, and shaft coupling members having a threaded engagement with the adjacent ends of the initial and final portions of said driving shaft, each of said couplings being formed with an end socket non-circular in cross section, the intermediate shaft section being flexible and having non-circular ends detachably fitted in the sockets of said coupling members. 10

In testimony whereof I affix my signature.

JOHN W. SINGER.