Aug. 30, 1932. A. H. JONES 1,874,301

GRINDING DEVICE

Filed March 18, 1930

Fig. 1.

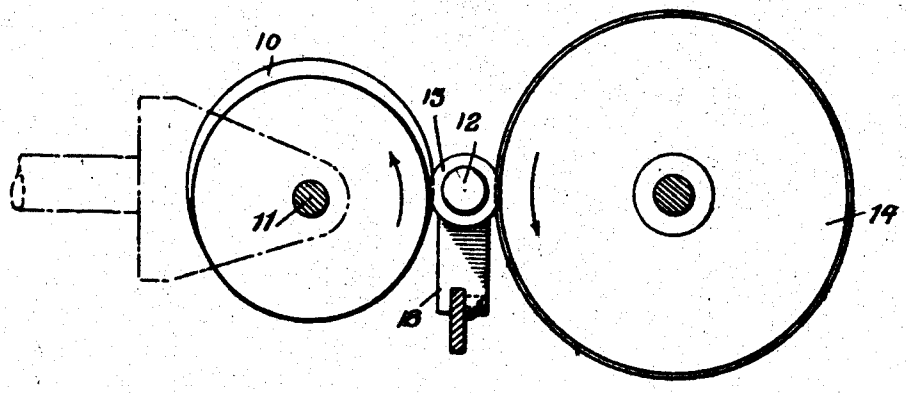


Fig. 2.

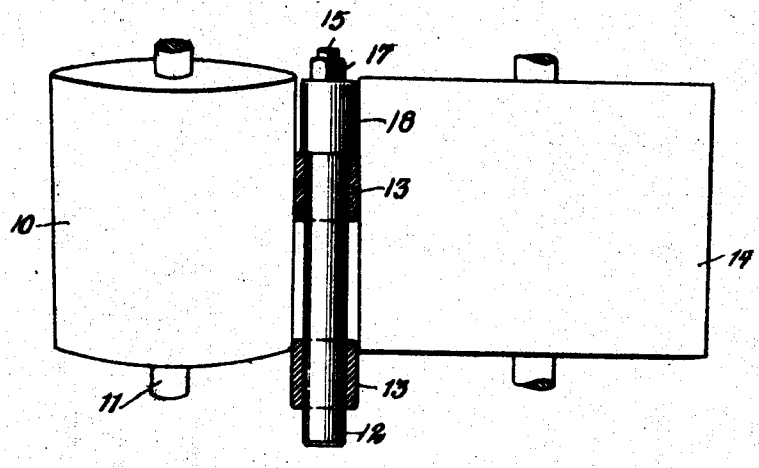


Fig. 3.

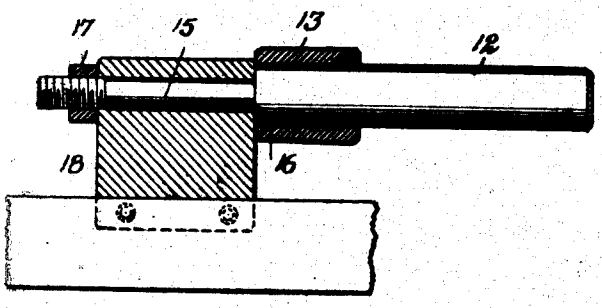
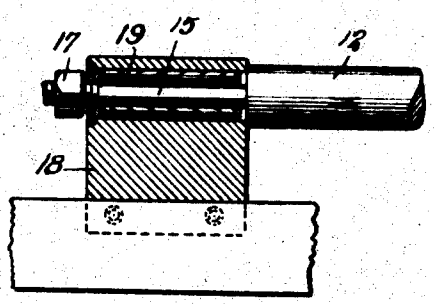


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE

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GRINDING DEVICE

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This invention relates to a grinding device which is designed and adapted for grinding machine parts such as cylindrical bearings or bushings.

The principal object of the invention is the provision of an improved and efficient device of the indicated character which will operate on a cylindrical bearing or bushing and grind the external surface thereof in such a manner that the external surface will be trued or be made concentric with the bore or internal cylindrical surface thereof.

The nature of the invention and its distinguishing features and advantages will appear when the following specification is read in connection with the accompanying drawing, in which

Figure 1 is an end view of a device embodying the features of the invention;

Figure 2 is a plan view of the device and illustrating the manner in which bushings are trued;

Figure 3 is a side view of a mandrel and the supporting means therefor, which is shown in section;

Figure 4 is a view similar to Figure 3, but showing a modified form of supporting means.

It is to be understood that the device will be incorporated in a machine known as a centerless grinder and includes a feeding roller, a grinding roller or wheel, and a mandrel on which the work or cylindrical bearings or bushings to be trued are mounted and acted on by the feeding roller and grinding roller in a manner to be hereinafter explained.

The feeding roller 10 is of tapered formation, and is mounted for rotation on or with a shaft 11 capable of being adjusted with respect to the mandrel 12, so as to impart axial movement of the work, such as a cylindrical bearing or bushing designated 13, while arranged on the mandrel. It is to be understood that the feeding roller 10 is movable into and out of feeding position by suitable mechanism forming no part of the present invention and not illustrated in the drawing. The grinding roller or wheel 14 is mounted for rotation and also for movement relative to the mandrel, into and out of a grinding position, by suitable means forming no part of the present invention and not illustrated in the drawing. The grinding roller or wheel 14 is preferably, though not necessarily, of tapered formation. The feeding roller 10 and the grinding roller or wheel 14 rotate in the same direction.

In accordance with the most important feature of the invention, the mandrel 12 will be approximately equal in diameter to the internal diameter of each piece of work, bearing or bushing arranged on the mandrel so that the piece of work, bearing or bushing may be readily slid on the mandrel and be caused to move axially thereon. As shown in Figure 3, the mandrel 12 has a reduced portion 15 which provides a shoulder 16. The portion 15 is threaded to receive a nut 17. The portion 15 extends through a bore in a fixture 18 constituting a stationary part of the grinding machine. The nut 17 is threaded on the portion 15 and co-operates with the shoulder 16 to securely hold the mandrel 12 in a horizontally disposed position between the rollers 10 and 14 when the latter are brought to the active position.

From the foregoing it will be apparent that when it is desired to true wall variations in a cylindrical bearing or bushing, said bearing or bushing may be slid onto the mandrel 12. The feeding roller 10 and the grinding roller or wheel 14 are then set or adjusted with respect to the bearing or bushing on the mandrel 12. Both rollers 10 and 14 are then put in motion and rotate in a counter-clockwise direction. By reason of the fact that the feeding roller 10 is of tapering formation and set to rotate on an axis disposed at an angle with respect to a horizontal plane, the bearing or bushing arranged on the mandrel will be caused to move axially thereon toward the fixture 18. At the same time the grinding roller or wheel 14 will grind the bearing or bushing and slightly reduce the same in diameter to the desired degree. The external cylindrical surface of the bearing or bushing will be trued or be made concentric with the bore or internal cylindrical surface thereof. It is to be understood that the bearing or

bushing may be ground throughout its entire length or only partly of the length thereof, which will put the bearing or bushing in condition to be subjected to the operation of other machines to produce a finished product. The chief purpose of the present device is to true the work so that the external surface of a bearing or bushing will be concentric with the internal surface thereof. It will be apparent that the fixture 18 limits the movement of the bushing or bearing 13 arranged on the mandrel for truing, and that several of the bearings or bushings may be arranged on the mandrel for this purpose, after which they may be removed by hand.

It is to be understood that, if desired, the mandrel 12 may be rotatably mounted, as shown in Figure 4, in which the portion 15 of the mandrel 12 extends through a roller bearing 19 positioned in the fixture 18. It will therefore be apparent that the bearings or bushings to be trued may rotate on the mandrel 12 or may rotate with the mandrel 12 while they move axially as they are being subjected to the action of the feeding roller 10 and the grinding roller 14. By varying the angularity of the feeding roller 10, the bearing or bushing to be trued may be fed at various speeds. The feeding roller 10 will be rotated at a slower speed than the grinding roller 14 to obtain the proper co-operation of the roller.

I claim:

1. A grinding device of the class described comprising the combination of a fixed horizontally disposed mandrel on which work may be arranged for rotational and axial movement, an adjustable tapered roller adapted to rotate in contact with the work arranged on said mandrel to cause the work to rotate and to move axially of the mandrel, and a rotatable grinder adapted to subject the work to a grinding action while being rotated on and moved axially of said mandrel.

2. The combination with a feeding roller and a grinding wheel, both of which rotate in the same direction, of a rotatable mandrel interposing said roller and wheel in set relation thereto and adapted to receive for rotational and axial movement thereon a bushing or the like, said feeding roller serving for the purpose of causing the axial movement of the bushing on the mandrel and also the rotational movement of the bushing or mandrel or both, and said grinding wheel serving for the purpose of subjecting the bushing to a grinding action while the bushing is being moved with and/or with respect to said mandrel.

3. A grinding device of the class described comprising the combination of a work supporting mandrel, a roller adapted to rotate in contact with the work arranged on said mandrel to cause the work to rotate and to move axially of the mandrel, and a tapered grinding roller adapted to subject the work to a grinding action while being rotated on and moved axially of said mandrel.

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