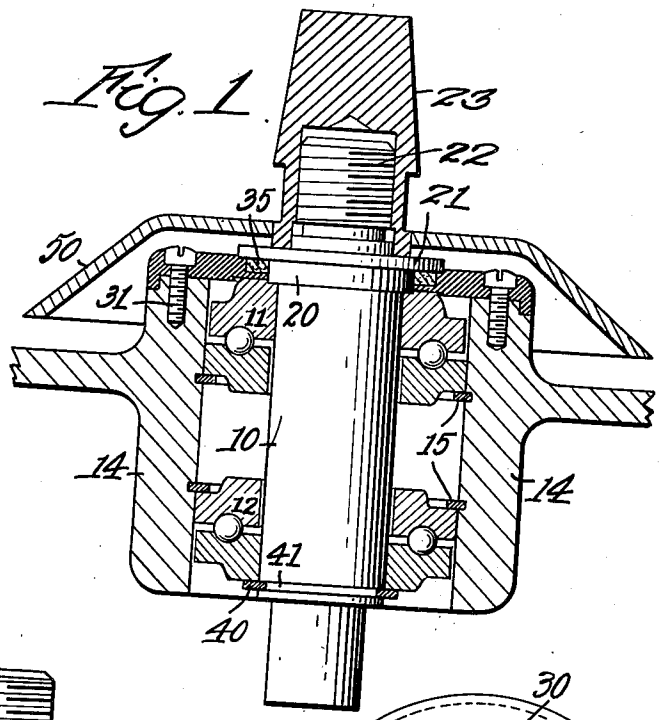
July 28, 1942. A. L. SIMONDS 2,291,356

MACHINE SPINDLE AND PACKING THEREFOR

Filed April 14, 1941

Fig. 1.



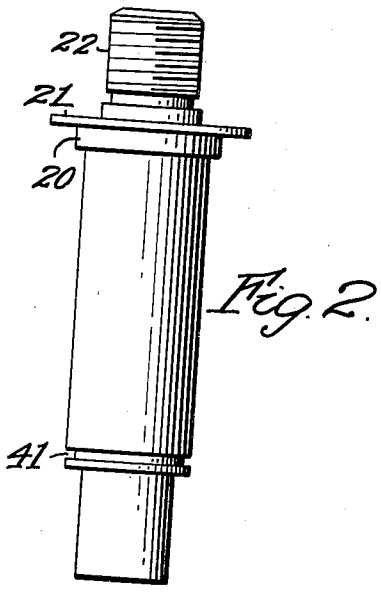


Fig. 2.

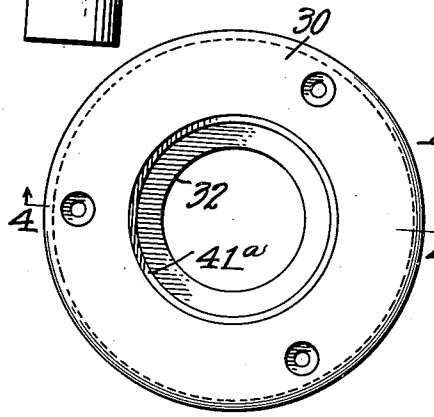


Fig. 3.

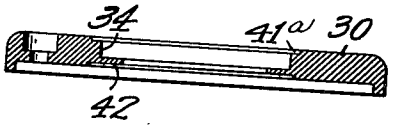


Fig. 4.

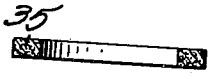


Fig. 5.

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Patented July 28, 1942 2,291,356

UNITED STATES PATENT OFFICE

2,291,356

MACHINE SPINDLE AND PACKING THEREFOR

Albert L. Simonds, Southbridge, Mass.

Application April 14, 1941, Serial No. 388,522

1 Claim. (Cl. 308—227)

This invention relates to machine spindles and to means for excluding dirt or abrasive from the bearings of such spindles. The invention is particularly applicable to vertical spindles such as are used in lens-grinding machines or in other grinding or polishing machines.

In such machines in which fine loose abrasive is used, it has been found extremely difficult to prevent entrance of dirt or abrasive to the bearings, with consequent rapid wear and short life.

It is the general object of my present invention to provide an improved spindle construction and an improved packing for said spindle, which parts coact in a very effective manner to exclude dirt or abrasive from the spindle bearing.

To the accomplishment of this general object, I have provided the improved spindle and packing construction shown in the drawing and described in detail in the following specification.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

A preferred form of the invention is shown in the drawing, in which

Fig. 1 is a sectional front elevation of my improved spindle and packing;

Fig. 2 is a front elevation of the spindle;

Fig. 3 is a plan view of the housing cap;

Fig. 4 is a sectional front elevation of the cap, taken along the line 4—4 in Fig. 3; and

Fig. 5 is a sectional front elevation of the packing ring.

Referring to Fig. 1, I have shown my improved spindle 10 rotatably mounted in ball bearings 11 and 12, which are held in spaced relation in a housing 14 by snap rings 15 seated in spaced grooves in the housing.

The spindle 10 has an enlarged portion 20 surmounted by a wide flange 21 and by a threaded portion 22 to which an adaptor 23 of any desired form may be applied.

A housing cap 30 is fixed to the upper end of the housing 14 by screws 31 and is provided with an inner opening 32 (Fig. 3) somewhat closely clearing the enlarged portion 20 of the spindle 10. The cap 30 is also provided with an annular recess 34 in which a packing ring 35 is seated.

The upper surface of the ring 35 is closely engaged by the under surface of the flange 21, as clearly shown in Fig. 1. The spindle is retained in vertical position by a snap washer 40, inserted in a groove 41 near the lower end of the spindle and so positioned that the flange 21 firmly engages the packing 35 when the snap washer 40 is in position.

The cap 30 has a shallow outer recess 41a to clear the outer edge of the flange 21 and to receive dirt or abrasive, and also has a shallow recess 42 on its under side to clear the upper part of the upper bearing 11. The ball bearings 11 and 12 are not shown in detail but may be of any usual commercial form.

The packing ring 35 is formed of a firm felt or other similar cushion material and is of such dimensions that it fits snugly in the recess 34 and also snugly engages the cylindrical surface of the enlarged portion 20 of the spindle. The ring 35 is also of such thickness that it closely engages the underside of the flange 21 when the parts are assembled.

A flinger or protector 50 is mounted on the spindle 10 above the flange 21 and projects over the entire bearing and housing as clearly shown in Fig. 1. Any suitable grinding wheel or form may be mounted on the adaptor 23 or may be attached direct to the threaded portion 22 of the spindle.

With this construction, entry of dirt or abrasive to the bearings 11 and 12 is very effectively prevented. Such dirt or abrasive must first pass upward and inward under the rapidly rotating flinger or protector 50, and must then escape the recess 41 and work inward against centrifugal force for the entire width of the flange 21 with which the packing 35 is in close engagement.

If any dirt or abrasive reaches the inner edge of the flange 21 and packing 35, it must then travel downward between the packing and the enlarged portion 20 of the spindle and through the opening 32 in the housing 14 before it can reach the bearings, which in themselves may be additionally sealed or protected.

My improved spindle, manufactured as above described, is found in practical operation to very effectively exclude dirt and abrasive and to have a much longer useful life than with the constructions commonly used heretofore.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

In a grinding machine, a fixed housing, a vertical spindle having an upper annular horizontal flange of substantial width fixed thereto and rotating therewith, an upper thrust bearing for said spindle mounted in said housing, a lower thrust bearing for said spindle mounted in said housing and positively held from upward move-

ment therein, an upper housing cap through which the upper end of said spindle extends, said cap having an open recess in its top face, a packing ring seated in said recess, and positioning means on said spindle engaging a lower surface of said lower thrust bearing and positively holding said spindle from upward movement in said thrust bearings and housing, said positioning means and said annular flange being spaced apart axially on said spindle by a predetermined distance such that they coact to hold said packing ring under firm and continuous compression between the under surface of the annular horizontal flange on said spindle and the horizontal bottom surface of the open recess in the top face of the housing cap.

ALBERT L. SIMONDS.