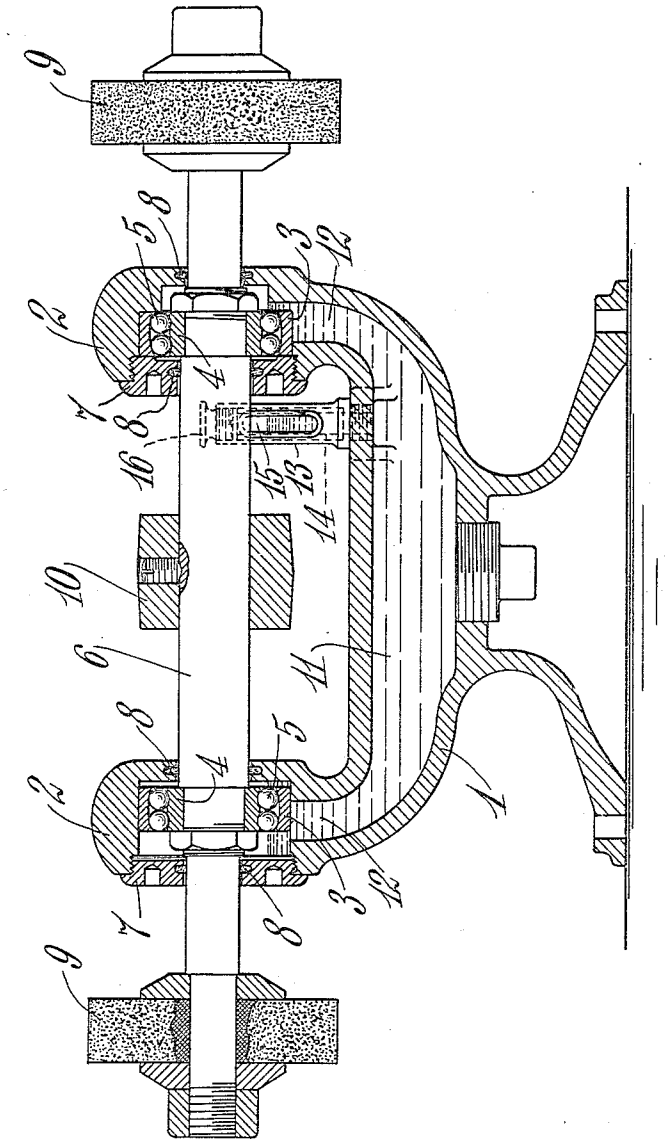
M. HARRISON.

HIGH SPEED SPINDLE MOUNTING AND LUBRICATING DEVICE.

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1,243,661. Patented Oct. 16, 1917.



WITNESSES:

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HIGH-SPEED-SPINDLE MOUNTING AND LUBRICATING DEVICE.

1,243,661. Specification of Letters Patent. Patented Oct. 16, 1917.

Application filed August 14, 1916. Serial No. 114,816.

To all whom it may concern:

Be it known that I, MATTHEW HARRISON, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in High-Speed-Spindle Mounting and Lubricating Devices, of which the following is a specification.

This invention relates to lubricating devices for the spindles of high speed machines, such as grinding machines, for example, the bearings of which must, by reason of the character of the work done by the machine, be constantly and automatically lubricated and effectively protected from dust and the like produced by the machine.

The object of the invention is to provide in a machine of the class described a supporting frame having a central reservoir formed therein for lubricant and two spaced upstanding boxes adapted to receive and entirely inclose the bearings of a high speed spindle, together with an indicating and filling means for the reservoir, which reservoir is arranged to be filled to such a level that the bearings directly dip therein, the construction being characterized by constant, automatic, and effective lubrication by a simple and advantageous structural arrangement.

Other objects and advantages will appear in the detailed description to follow and in the appended claims.

For the purposes of illustrating one manner in which the invention may be put to use, a single preferred embodiment thereof is shown in the accompanying drawing, in which the figure shows a sectional elevation of a grinding machine embodying the invention.

Referring to the drawing in detail, a supporting frame 1 is formed with two spaced bearing boxes 2 which extend upwardly above the frame on either side thereof. Within each box 2 is a bearing comprising relatively rotatable rings 3 and 4 with balls 5 therebetween. A shaft or spindle 6 is mounted in the rings 4 and extends between and entirely through each box 2. Threaded into one face of each of the latter is a dust cap 7 which permits the insertion and removal of the bearing and normally protects the latter from dust and the like. Washers 8 of suitable material, such as felt, are placed in each dust cap 7 and in the closed face of each box 2, which washers are arranged to bear against shaft 7 on either side of its bearings to effectively prevent the entrance of dust, grit, etc., through the small clearance openings between the shaft and the dust caps or boxes. The shaft 7 bears at each end a suitable grinding tool, such as the wheels 9 and, intermediate the boxes 2, a suitable driving pulley 10.

The frame 1 is hollow, forming a reservoir 11, and cored passages 12 lead from the latter to the interior of each box 2. Mounted in the upper face of frame 1 and behind shaft 6 is an upstanding sleeve 13 which is adapted to receive a glass tube 14 and is formed with an opening 15 to expose the glass. A removable cap 16 forms a closure for the sleeve and tube.

The parts 13, 14, and 15 form a visual indicator, whereby the level of oil in the hollow frame may be observed. Oil is introduced into reservoir 11 through the tube 14 after the cap 16 is removed. The hollow frame is filled until the oil reaches the level shown in the drawing. This level is conveniently indicated by a line on the gage. The particular frame structure described together with the manner of mounting the bearings therein is important because it permits the maintenance of oil at such a level that the bearings may directly dip therein. Thus, it will be observed that each ball 5 rides once a revolution through the oil and, therefore, receives the frequent and effective lubrication necessary in machines of this character which operate at exceedingly high speeds. No special means are necessary, as heretofore, to elevate oil from the reservoir to the bearings but, on the contrary, by the accessibility of the bearings to the passage 12 by means of the spaces between the bearings and dust caps, direct lubrication is obtained with advantageously simple means and with an entire absence of the usual devices, such as oil rings, wicking, and the like.

It is to be noted that the utilization of the otherwise useless hollow space in a supporting frame as a container for oil permits a considerable volume of lubricant to be placed therein. Moreover, by having a rela-

tively large volume of oil continually in the machine, the oil gradually separates and dirt, foreign substances, and the heavier oil settle in the bottom of the reservoir, leaving oil of the best lubricating value at a level where it is available for the bearings. Furthermore, since the bearings are dust proof, the oil within the frame cannot readily become contaminated so that only once in a great while is it necessary to clean the reservoir and supply an entirely fresh charge of lubricant. The necessity for additional oil is indicated by the lowering of the oil level in tube 14 and ordinarily only small amounts need be introduced at infrequent intervals to maintain the oil at the desired level shown.

The invention has been described in a preferred form for the purposes of illustration, but the scope of the invention is defined by the appended claims rather than by the foregoing description.

What I claim is—

1. A machine of the character described, comprising, a frame having one or more hollow lubricant containing parts and provided with two spaced integral bearing boxes upstanding therefrom, relatively rotatable bearing devices mounted and completely inclosed in said boxes, a tool carrying spindle mounted in the bearing devices, driving means for the spindle intermediate said boxes, the latter formed with spaces at the side of said devices, passages formed in the frame communicating between the spaces and the hollow lubricant containing part or parts of the frame, and a visual gage tube indicating the level in said passages and adapted to permit lubricant to be introduced into the frame, all constructed and arranged so that lubricant may be maintained at such a level that said devices dip therein.

2. A machine of the character described, comprising, a hollow frame having two spaced bearing boxes upstanding therefrom, bearings in the boxes, a shaft mounted in the bearings, a driving pulley fixed on the shaft intermediate the bearing boxes, means tightly inclosing each bearing in its box to prevent the ingress of dust and the like, the frame being made hollow to form a central reservoir for oil and also formed with passages communicating between the reservoir and each of said boxes, and a visual indicator, whereby the level of oil may be observed, all constructed and arranged so that the hollow frame may be filled with a relatively large body of oil, the upper level of which slightly overlaps the lower part of the bearings whereby the latter are lubricated directly by the pure oil at the upper level of the body of oil.

MATTHEW HARRISON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."