F. A. BRASSILL.

BEARING HEAD FOR GRINDING MACHINES.

APPLICATION FILED DEC. 17, 1917.

1,298,448. Patented Mar. 25, 1919.

Fig. 1

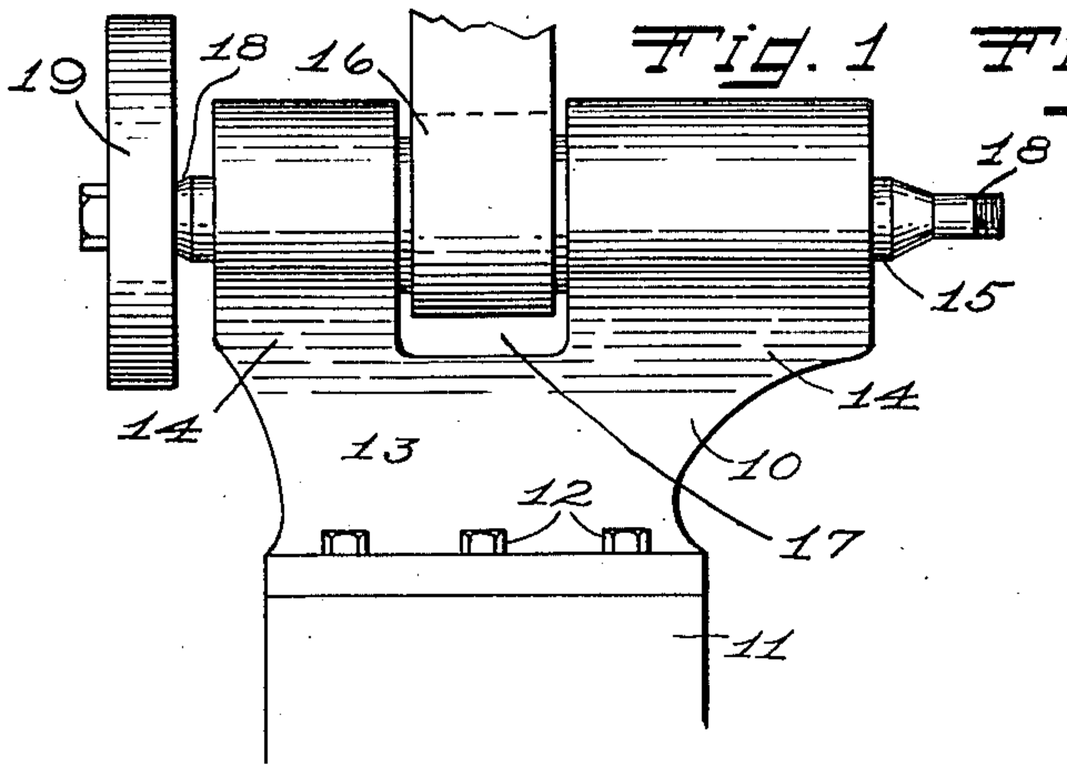
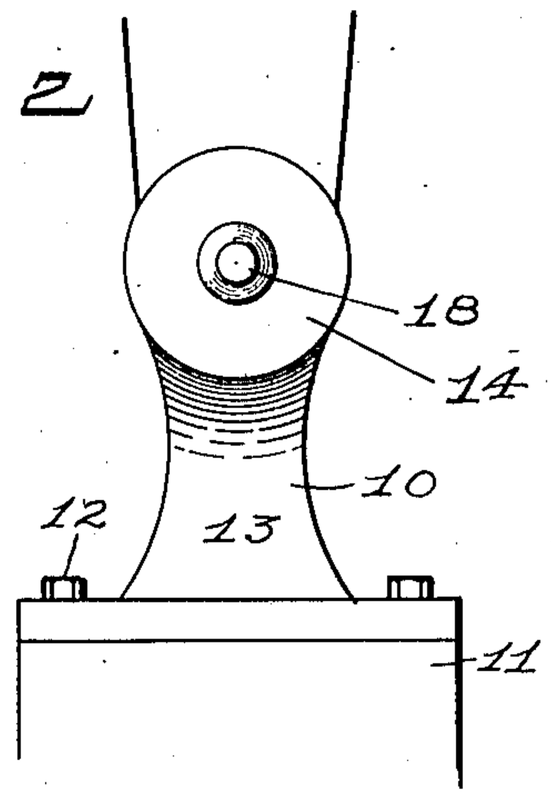


Fig. 2



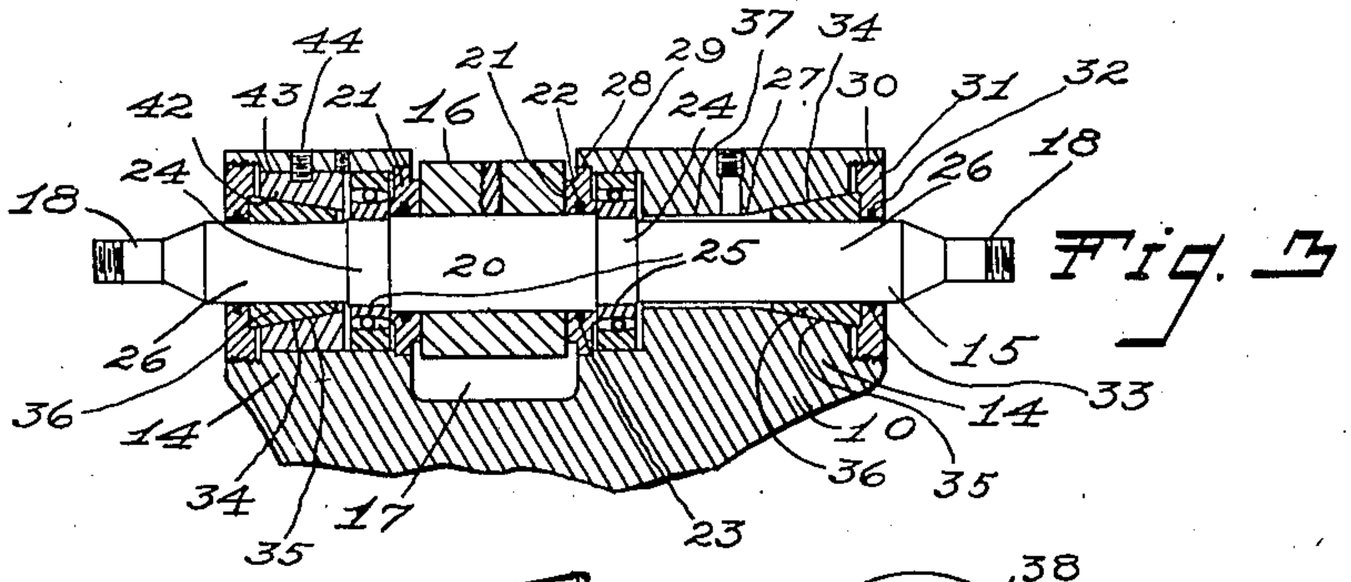
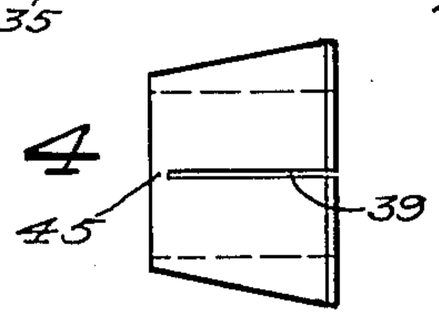


Fig. 3

Fig. 4



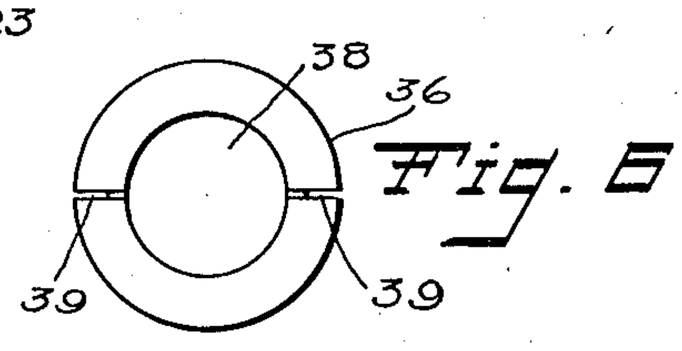
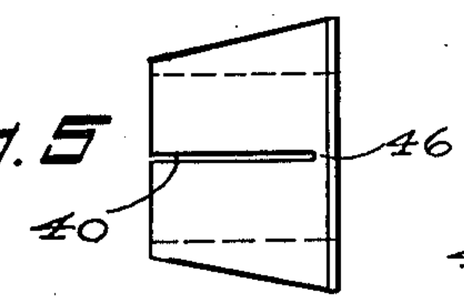


Fig. 6

Fig. 5



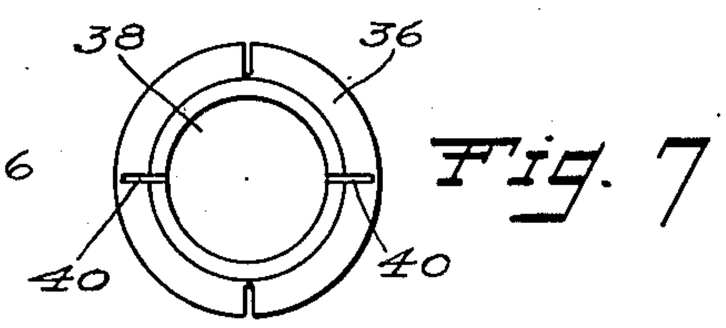


Fig. 7

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UNITED STATES PATENT OFFICE.

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BEARING-HEAD FOR GRINDING-MACHINES.

1,298,448. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed December 17, 1917. Serial No. 207,460.

To all whom it may concern:

Be it known that I, FRANK ALOISIOUS BRASSILL, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Bearing-Heads for Grinding-Machines, of which the following is a specification.

My invention relates to improvements in bearing heads for grinding machines, and the object of my improvement is simplicity and economy in construction and convenience and efficiency in use.

In the accompanying drawing:—

Figure 1 is a front elevation of a bearing head for a grinding machine and the upper part of the column to which the same it attached and which bearing head embodies my invention.

Fig. 2 is an end elevation of the same.

Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a front elevation, on an enlarged scale, of one of the sleeve bearings shown in Fig. 3.

Fig. 5 is a plan view of the same.

Fig. 6 is an end elevation of the same as viewed from the large end.

Fig. 7 is an end elevation of the same as viewed from the small end.

My improved bearing head 10 is incorporated in the structure of any grinding machine of approved form by being mounted on the upper end of the column 11 by a plurality of bolts 12, which column 11 in the present instance corresponds to the form shown and described in the patent application filed March 6, 1917, Serial No. 152,709, by Oscar W. Nilson and myself.

Bearing heads of the form under consideration comprise a body 13 resting on the column 11 and provided with a pair of upwardly extending standards 14 at the upper end, in spaced relation, each of which is provided with a bearing structure for the spindle 15, the driving pulley 16 being mounted on the spindle 15 and positioned in the space 17 between the standards 14. Also, the spindle 15 extends outwardly beyond the standards 14 at each end, the end portions 18 being adapted to receive a grinding wheel 19.

My invention resides in the peculiar form of the bearing structures supported by the standards 14, as will now be described.

The spindle 15 comprises an enlarged portion 20 on which the driving pulley 16 is mounted and which is approximately at the middle, though actually to one side of the middle because of a difference in length of the two bearing structures. On each side of the pulley 16 and encircling an extension of the enlarged portion 20 is a filler washer 21 that has on the interior or bore a radial groove 22 in which is housed a washer 23 of felt that rubs on the spindle 15. Considering the spindle 15 further, the same comprises outwardly from the enlarged portion 20, on each side, a short reduced portion 24 that supports the inner cone member of a ball bearing structure 25. Outwardly from the said inner reduced portion 24 is the outer reduced portion 26, slightly smaller in diameter than the said inner reduced portion 24, and which extends outwardly through the remainder of the head structure, the extreme end portions 18 that receive the grinding wheels 19 being further reduced.

Considering the construction of the standards 14, these except for differences in length, are generally similar as to the exterior structure. As to the interior, the right standard 14, as shown in Fig. 3, is provided with a bore 27 of different size and form for different portions of the length, comprising the short portion 28 at the inner end, adjacent the pulley 16 that is filled by the filler washer 21, next to which is a slightly reduced portion 29 that supports the outer cone member of the ball bearing structure 25. At the outer end is a short portion 30, of relatively large diameter and having a screw thread, that receives the clamping nut 31. The said nut 31 encircles the outer reduced portion 26 of the shaft or spindle 15 and serves as a filler member in coöperation therewith by means of a felt washer 33 positioned in a groove 32 in the wall opposed to the said spindle 15. Considering the bore 27 further, the same comprises inwardly from the threaded portion 30 a seat 34, of conical form and of appreciable length, that is a fit for the conical periphery of the sleeve bearing 36. Connecting the conical portion 34 and the ball bearing supporting portion 29 is the connecting portion 37, opposed to a portion of the outer reduced portion 26 of the spindle 15, and of sufficient diameter to provide clearance therefor.

In order to facilitate the assembling of the parts the interior of the left standard

14 is provided with an additional removable part in the form of a sleeve 42 fitted into a bore 43 and held in place by a set-screw 44, and which bore 43 is an extension of the bore 29 that serves as the housing for the outer cone member of the left ball bearing structure 25. The seat 34 for the left sleeve bearing 36 is provided in the removable sleeve 42. As the left standard 14 is relatively short, substantially the entire length of the removable sleeve 42 is utilized for providing the seat 34, there being no connecting portion of cylindrical form, such as the connecting portion 37 on the right side.

The sleeve bearing 36 has a conical periphery 35 that fits in the seat 34 and has a bore 38 that is an operative fit for the outer reduced portion 26 of the spindle 15, suitably to serve as a cylindrical bearing therefor, and is held in position on the seat 34 by the clamping nut 31.

As a further detail, the sleeve bearing 36 is provided with a set of longitudinal slits, comprising, as shown two pairs of slits as follows:—one pair consisting of slits 39 positioned on opposite sides and extending from the large end of the conical structure for nearly though not entirely the full length, leaving an unslitted portion 45 in line with the slit 39, and a pair of slits 40 in a diametral plane at right angles to the plane of the slits 39, and extending similarly for the greater part of the length of the bearing structure, beginning, however, from the side of the smaller end, and leaving a portion 46 that is solid in line with the slits 40.

The slits 39 and 40 extend radially through the material of the bearing structure, and may be relatively narrow. I find that a cut of from one thirty-second to one-sixteenth of an inch in width to be satisfactory.

As described, the spindle 15 is operatively supported by two pairs of bearings, comprising an inner pair, composed of the ball bearing structures 25, and positioned one on each side of and adjacent to the pulley 16, and an outer pair, composed of the sleeve bearings 36, and positioned adjacent the spindle ends. Thus the ball bearings are adapted to sustain the relatively direct pulling effect of the belt, and the sleeve bearings are adapted to maintain accuracy of position of the spindle. Also, the sleeve bearings, slitted as described, are adapted to permit of taking up of wear by means of the clamping nut, and also provides a flexible and yielding construction, suitable for sustaining sudden shocks, due to side thrusts at the ends, such as occur in the operation of a grinding wheel, and thereby reduces the heating of the bearings. The slits provide room for expansion in case of heating, and also provide means for housing oil and grease.

Other arrangements for slits in the sleeve bearings may be provided. In some cases there may be a combination of longitudinal slits and relatively short circumferential slits at the ends and connecting with the said longitudinal slits.

I claim as my invention:—

1. In a bearing head for a grinding machine, a pair of standards in spaced relation, a spindle extending through the said standards, a pulley supported by the said spindle and positioned between the said standards, and bearing structures for the said spindle housed in the said standards, the said bearing structures comprising a pair of ball bearings positioned one on each side of the said pulley and a sleeve bearing positioned outwardly from each of the said ball bearings.

2. In a bearing head for a grinding machine, a pair of ball bearings for the spindle in suitably spaced relation to receive the driving pulley in the separating space, and a sleeve bearing positioned outwardly from one of the said ball bearings for operatively supporting the end portion of the spindle.

FRANK ALOISIOUS BRASSILL.