J. B. NAINTEAU.

SPINDLE.

APPLICATION FILED AUG. 5, 1918.

1,293,165.

Patented Feb. 4, 1919.

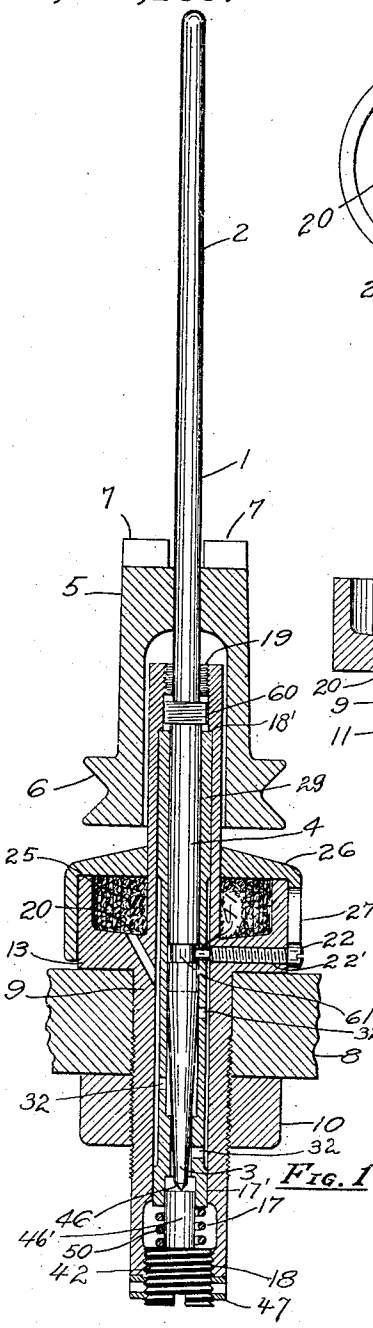


FIG. 1

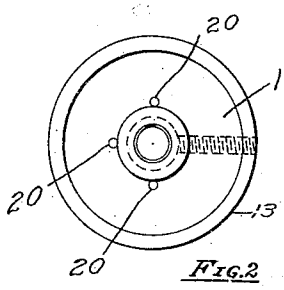


FIG. 2

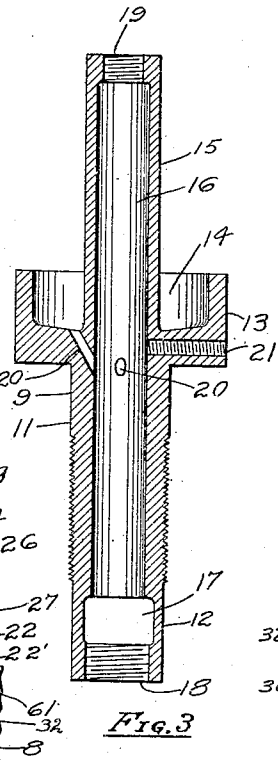


FIG. 3

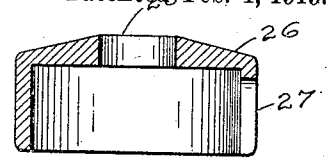


FIG. 4

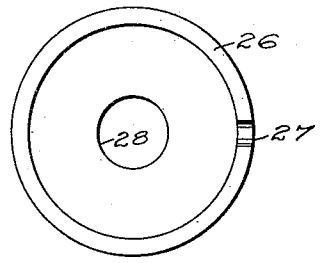


FIG. 5

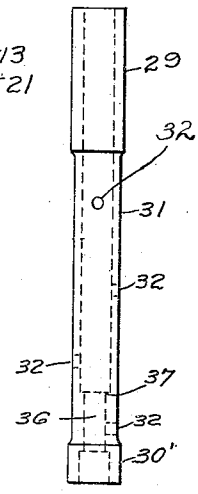


FIG. 6

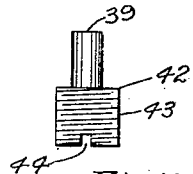


FIG. 7

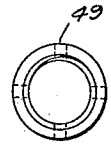


FIG. 8

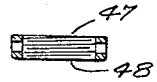


FIG. 9

Witnesses.

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UNITED STATES PATENT OFFICE.

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SPINDLE.

1,293,165. Specification of Letters Patent. Patented Feb. 4, 1919.

Application filed August 5, 1918. Serial No. 248,409.

To all whom it may concern:

Be it known that I, JOHN B. NAINTEAU, a citizen of United States, residing at Woonsocket, in the county of Providence, State of Rhode Island, have invented certain new and useful Improvements in Spindles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to spindles and is particularly designed to overcome some of the defects which it has developed, are present in the specific structure set forth in U. S. Letters Patent No. 1,147,638, granted to me July 20, 1915. In that structure, the spindle is provided with a threaded enlargement which screws through and inwardly beyond the upper end of the sleeve and serves to prevent lifting of the spindle out of the bolster and sleeve when the bobbin is lifted from the whirl. This arrangement is effective so long as the whirl turns in the direction given the spindle when screwing its enlargement through the threaded reduced interior diameter of the upper end of the sleeve. When, however, the whirl and therewith the spindle is rotated in the opposite direction and in the lifting of the bobbin the spindle is raised, the threads of its enlargement will engage those of the sleeve and the spindle will be instantly moved upwardly out of the sleeve and bolster. It is to prevent this upward movement of the spindle that is an important object of this improved structure.

In the patented structure referred to, the bolster is screwed into the sleeve, the adjusting screw for the spindle serving to jam the bolster and hold it against adjustment in the sleeve. A further object of the present invention is to permit of adjustment of the spindle without adjustment of the bolster and at the same time to support the bolster against dropping from place when the combined spindle and bolster retaining screw is backed out preparatory to moving the spindle.

Other objects of the invention include the substitution for the particular oil reservoir cap with its locking screw of an improved structure wherein the cap gravitates to position to hold the oil ducts out of registration so that registration cannot be effected accidentally under influences incident to the operation of the mechanism.

In the drawings;—

Figure 1 is a vertical section through a portion of a spinning machine showing a spindle mounting embodying the present invention.

Fig. 2 is a plan view of the sleeve with its circumscribing oil cup, the threaded perforations for the spindle and bolster retaining screw being shown in dotted lines.

Fig. 3 is a vertical longitudinal section through the sleeve and circumscribing oil cup in the plane of one of the oil feeding ducts and the threaded perforation that receives the retaining screw referred to.

Fig. 4 is a central vertical section through the cap in the plane of the oil introducing slot.

Fig. 5 is a bottom plan view of the cap.

Fig. 6 is an elevation of the bolster with its bore and ducts indicated in dotted lines.

Fig. 7 is an elevation of the spindle adjusting screw.

Fig. 8 is a plan view of the lock nut for the adjusting screw.

Fig. 9 is a central longitudinal section through the nut in the plane of the spanner receiving openings.

Referring now to the drawings, there is shown at 8 a portion of the spindle rail of a spinning machine in which there is illustrated, the sleeve 9, the lower portion of which is threaded to receive a lock nut 10 that holds the sleeve seated firmly down in the rail with its circumscribing oil cup 13 firmly upon the rail.

The sleeve 9, which is hollow as illustrated, is internally threaded at its lower end as shown at 18 and directly thereabove is unthreaded as shown at 17. Above the portion 17 the interior diameter of the sleeve is suddenly reduced as shown at 17′ and this diameter is continued to near the upper end of the sleeve where it is sharply reduced to form the squared shoulder 18′. Thereabove, the interior diameter is further reduced and the sleeve is provided with interior threads throughout the extent of this finally reduced portion as shown at 19.

Disposed within the sleeve 9 and with its upper end snug against the shoulder 18′ is a bolster 29, the end portions of which snugly but slidably fit the portion 17′ of the bore of the sleeve while the intermediate

portion is of lesser diameter so that oil from the cup 13 passing through the ducts 20 may enter between the sleeve and bolster as will be hereinafter referred to.

The bolster 29 has a central bore which at the end portions is of equal diameter while for a portion of its length near the lower end of the bolster it is of reduced but constant diameter as shown at 36.

In connection with the structure thus described, there is employed a bobbin spindle 1 having at a point spaced from both ends a circumscribing flange that is threaded, as shown at 60, and is proportioned to engage and screw through the threaded portion 19 of the sleeve. For a portion of its length below the flange 60, the spindle is cylindrical as shown at 4 and in the lower part of this cylindrical portion is a circumscribing groove 61 which registers with a threaded passage 22′ formed radially of the bottom wall of the oil cup and with a corresponding perforation 41 in the wall of the bolster. A screw 22, the head of which impinges against the curved periphery of the oil cup is removably engaged in the opening 22′ and has a reduced and unthreaded inner end portion that passes through the perforation 41 and enters the circumscribing groove 61 of the spindle, thus preventing longitudinal movement of the spindle from the bolster while permitting its free rotation. While the groove 61 is of sufficient extent longitudinally of the spindle to permit that degree of longitudinal movement necessary for rotation unobstructed by the screw, the spindle may not rise to an extent to carry the threaded flange 60 into contact with the upper end wall or rather the shoulder at the upper end of the portion 18′ of the bore of the sleeve. Thus, if the spindle be rotating in a direction that would screw the flange 60 outwardly through the portion 19 of the sleeve bore, this can not occur because the spindle can not rise to engage the thread of its flange with those of the part 19 of the sleeve bore.

The lower portion of the spindle below the cylindrical part 4 is gradually tapered as shown at 3, to the extreme end portion which is tapered sharply to the extremity with the formation of a cone 46. The apex of the cone 46 rests upon the end of the axial extension 46′ of a screw plug 42 that is engaged in the threaded lower end portion 18 of the bore of the sleeve, this axial extension 46′ being snugly but slidably fitted within the lower end portion of the bore of the bolster.

Upon the axial extension 46′ of the plug 42, is disposed a helical spring 50 which supports the bolster when the screw 22 is removed to permit of withdrawal of the spindle, the spring holding the bolster against the shoulder 18′ with sufficient friction to prevent accidental rotation of the bolster from alinement of its perforation 41 with the passage 22′. A lock nut 47 is engaged upon the protruding end portion of the plug 42 and is provided with the usual radial spanner receiving perforations so that it may be set up against the lower end face of the sleeve with sufficient tightness to hold the plug in place. When the jamb nut 47 is loosened the plug may be manipulated to adjust the spindle longitudinally in the bolster, the spring serving under such conditions to hold the bolster in position.

The upper portion of the spindle is tapered from the flange 60 to its upper end and upon this portion of the spindle is removably disposed a whirl 5 having upon its upper end the radial fins 7 designed to removably engage the usual corresponding radial slots in the lower end face of the bobbin. The lower end portion of the whirl forms a pulley 6, through the medium of which the whirl is driven.

It is when the bobbin is lifted from the whirl and spindle that the spindle moves upwardly and engages the threads of its flange 60 with those of the part 19 of the bore of the sleeve. This is because of the tendency of the whirl to rise with the spindle, due to the friction between the fins 7 and the slots of the bobbin in which they engage which causes the whirl to move upwardly with the bobbin and further because of the frictional engagement of the upper taper of the spindle in the correspondingly tapered axial bore of the whirl.

The ducts or ports 32 in the wall of the bolster permit of passage of oil to the lower portion of the spindle from between the bolster and sleeve.

A cap 26 of cylindrical form is fitted snugly upon the oil cup 13 and has a central bore 28 that snugly receives the sleeve 9 at its upper portion, the cap having a longitudinal slot 27 formed in its wall and terminating short of the top of the cap so that when the cap rests with its top upon the upper edge of the cup, the slot is closed. When the cup is to be filled, the spout of an oil can is introduced into the slot 27 and the cap is raised until the upper end of the slot is above the upper edge of the cup, when oil may be injected into the cup over the wall. The slot 27 snugly but slidably receives the head of the retaining screw 22 above referred to so that the cap is held against rotation from a position of accessibility of its slot.

As in my previous patent referred to, the flange 60 is designed primarily to intercept the flow of oil upwardly of the spindle.

What is claimed is:—

1. The combination with a spindle, of a housing including a sleeve through one end of which the spindle projects, means for

supplying oil to the portion of the spindle surrounded by the sleeve, means carried by the spindle for preventing a passage of oil up the spindle past the top of the sleeve and means for preventing movement of the spindle to carry said preventing means exteriorly of the sleeve.

2. The combination with a spindle having a circumscribing groove, of a housing including a sleeve within which the grooved portion of the spindle is rotatably mounted and from which the spindle projects, means for supplying oil to the spindle within the sleeve, means carried by the spindle for preventing the passage of oil along the spindle and exterior to the sleeve and means carried by the sleeve and engaging the groove for holding the spindle against movement to carry said preventing means out of the sleeve.

3. The combination with a spindle, of a housing including a bolster receiving the spindle and a sleeve receiving the bolster, means for holding the spindle and bolster each against longitudinal movement from the sleeve and means for sustaining the bolster within the sleeve when said holding means is removed.

4. The combination with a spindle, a housing including a sleeve in which the spindle is received, the sleeve carrying an oil cup for lubricating the spindle, of means for holding the spindle against longitudinal movement from the sleeve and a cap for the oil cup having a longitudinal slot through its wall terminating short of the top of the cup and receiving the spindle holding means to prevent rotary displacement of the cap with respect to the cup.

In testimony whereof, I affix my signature.

JOHN B. NAINTEAU.

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