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SPINDLES FOR TEXTILE SPINNING AND LIKE MACHINES

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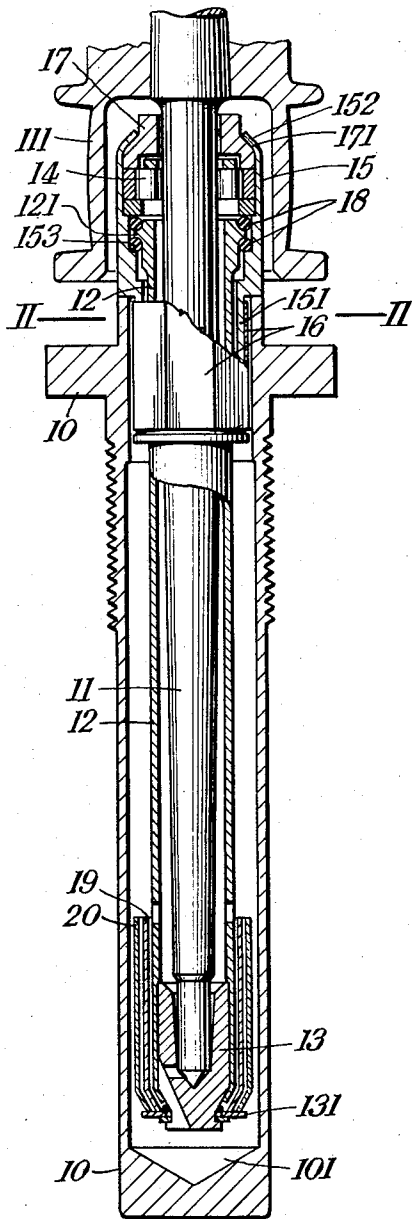


Fig. 1.

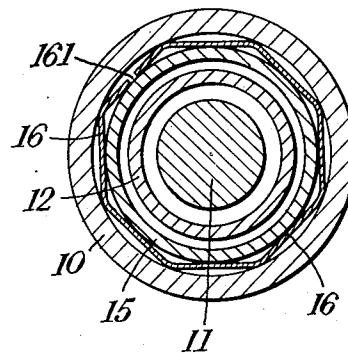


Fig. 2.

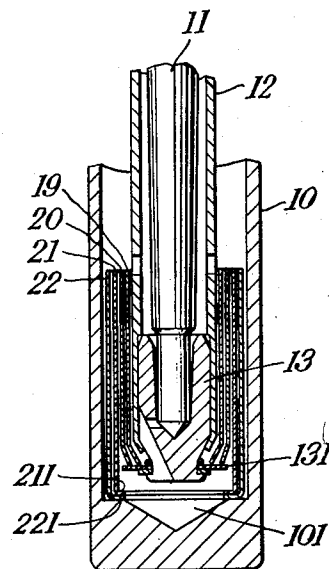


Fig. 3.

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SPINDLES FOR TEXTILE SPINNING AND LIKE MACHINES

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4 Claims. (Cl. 57—135)

With the object of providing an improved form of mounting for the spindles of textile spinning and like machines, which will be particularly suited for efficient operation when subjected to external vibrations either transmitted through the frame of the machine or resulting from an unbalanced package, the present invention proposes that the spindle blade shall be mounted in a tubular insert sleeve containing a footstep bearing for the base of the blade and supported at an intermediate point (conveniently approximately at the height of the driving wharve) by a journal bearing which is rigidly held in an outer sleeve which is mounted in the bolster with limited spring-controlled lateral freedom therein.

The insert sleeve is suspended resiliently at its upper extremity in said outer sleeve, so as to be capable of oscillating within the bolster, and means for damping such oscillating movement are incorporated in the latter in the region of the footstep bearing.

Said damping means may take the form of a plurality of co-axial bushes arranged one within the other and resting upon a flange projecting outwardly from the footstep bearing, clearance being provided between the inner bush and the lower end of the insert sleeve, and between the bushes, and between the outer bush and the bore of the bolster, to accommodate damping fluid, e.g. lubricating oil, by which the lateral movements of the parts are restrained. The lower extremities of the damping bushes may be fashioned with inwardly turned lips to prevent any tendency of the bushes to ride up the insert sleeve under operating conditions. If desired, where additional damping means are required, one or more supplementary bushes are provided, surrounding the bushes which are supported by the flange of the footstep bearing, but arranged to rest upon the bottom of the bolster, thereby reducing still further the oil-filled spaces between the inner damping bushes and the bolster and footstep bearing and so increasing the resistance to lateral movement of the footstep within the bolster without appreciably detracting from the desired result of preventing the transmission of machine vibrations to the spindle.

The nature of the invention will be more clearly understood from the following description of two embodiments of the invention, reference being made to the accompanying drawings. In said drawings, FIG. 1 is a vertical section of a textile spindle mounting, FIG. 2 is a section on the line II—II of FIG. 1 drawn to a larger scale, and FIG. 3 is a fragmentary sectional view depicting a modification of the base of the mounting.

Referring now to FIGS. 1 and 2, it will be seen that the spindle mounting incorporates the customary bolster 10, which is adapted to be secured in a spindle rail or holder (not shown) in conventional manner. The spindle blade 11 is rotatably supported within the bolster 10 by means of a tubular insert sleeve 12, which contains at its lower extremity a footstep bearing 13 for the base of the blade 11. At a point approximately at the height of the driving wharve 111 is a journal bearing 14 which is rigidly held in an outer sleeve 15.

Said outer sleeve 15 is provided with a spigot 151 which is received within the upper part of the bore of the bolster 10, and a tubular controlling spring is fitted between the opposing cylindrical surfaces of the spigot 151 and the

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bolster 10. Said tubular-spring 16 is of polygonal section, and it is split longitudinally at 161 along one of its facets. The function of this spring is to cushion the head of the spindle against vibration under heavy loading conditions.

At its upper end the said outer sleeve 15 has an inwardly turned flange 152 which encloses a shoulder 171 on a cap member 17, the lower end of which abuts against the roller bearing journal 14 which is located in the bore of the said outer sleeve 15, and the arrangement is such that the bearing 14 is afforded a rigid support in the latter. A flange 121 on the insert sleeve 12 beneath the bearing 14 is suspended between two rubber or like resilient annulae 18, 18 which are gripped between the underside of the bearing 14 and an inwardly projecting shoulder 153 of the outer sleeve 15.

The base of the bolster 10 contains the customary lubricant sump 101. Above the level of the sump the footstep bearing 13 carries a washer-like member 131 which forms a flange upon which the damping bushes 19, 20 rest by gravity. Said bushes 19, 20 are thereby maintained out of contact with foreign matter which may drain out of the lubricant into the lower part of the sump 101, and it is possible thus to ensure that polluted oil is not circulated between the said bushes for damping purposes. The absence of direct contact between the bolster 10 and the damping bushes 19, 20 prevents transmission of vibrations from the frame of the machine to the spindle.

The outer bush 20 has a relatively large clearance between itself and the bore of the bolster 10, to ensure that, under light loading conditions, the spindle blade 11 is free to assume a central axial position with the least resistance from the damping surfaces of said bushes 19, 20. The inner bush 19 has smaller clearances between its surfaces and those of the insert sleeve 12 and the outer bush 20, to provide effective damping of undesirable vibrations under heavier loading conditions.

As will be seen from FIGS. 1 and 3, the bushes 19, 20 are provided at their lower extremities with inwardly turned lips, the function of which, as previously discussed, is to prevent said bushes from riding up the sleeve 12 in operating conditions.

The modification shown in FIG. 3 includes two supplementary damping bushes 21, 22, arranged co-axially about the damping bush 20 in the space between the latter and the bore of the bolster. The bushes 21, 22 are flanged at their lower ends, so that the bush 22 rests by its flange 221 on the base of the bolster, in a manner which permits oil to pass beneath it and thus maintain circulation of the oil to the bore of the footstep bearing through ports provided in the wall thereof. The bush 21 rests by its flange 211 upon the inner face of the flange 221 of the bush 22. The presence of the said supplementary bushes 21, 22 reduces the amount of free space enclosed within the outer bush 20, restricting the degree of clearance between the bushes and so affording greater damping capacity in each space.

What we claim as our invention and desire to secure by Letters Patent is:

1. A spindle for a textile spinning and like machine, comprising a spindle mounting bolster having an open end and a base, said base including a sump, a tubular insert sleeve enclosed within said bolster, the length of said insert sleeve being laterally spaced from the inner wall of said bolster, the inner end of said insert sleeve being spaced from the base of said bolster, an outer sleeve mounted in said bolster, resilient means mounting said outer sleeve for limited controlled lateral freedom relative to said bolster, resilient means intermediate said insert sleeve and said outer sleeve and mounting said insert sleeve for oscillating movement within said bolster, a journal bearing rigidly supported by said outer sleeve, a spindle blade mounted in said tubular insert sleeve and having a base

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extending adjacent the inner end of said insert sleeve, said spindle blade being supported for rotational movement about its longitudinal axis by said journal bearing intermediate the ends of said spindle blade, a footstep bearing mounted by said insert sleeve at the inner end thereof for oscillating movement therewith and in bearing engagement with said base of said spindle, a flange carried by said footstep bearing, and a plurality of damping bushes having inwardly turned lips on their one ends, said bushes being supported on said flange adjacent their said one ends in coaxial spaced relation relative to one another and relative to said insert sleeve.

2. A spindle as claimed in claim 1, wherein the outer sleeve is spigotted in the open end of the bolster, the space between the opposing cylindrical surfaces of the sleeve spigot and the bolster containing a tubular spring of polygonal section and longitudinally divided along one of its facets.

3. A spindle mounting as claimed in claim 1, wherein the insert sleeve is suspended by a flange on its upper ex-

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tremity, which flange is located between resilient annulae which are gripped together between opposing faces of the outer sleeve and of the journal bearing.

4. A spindle as claimed in claim 1 wherein there are provided supplementary damping bushes arranged coaxially about said damping bushes on said flange, said supplementary damping bushes being flanged at their inner ends, the outermost supplementary bush resting on its said flange on said base of said bolster, the innermost supplementary bush resting on its said flange on the inner face of the flange of the next adjacent outer supplementary bush.

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