

T. ASHWORTH.
FOOTSTEP FOR SPINDLES.
APPLICATION FILED AUG. 27, 1901.

NO MODEL.

FIG. 3.

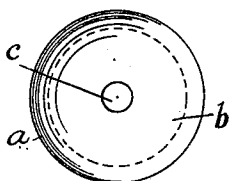


FIG. 1.

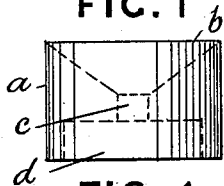


FIG. 2.

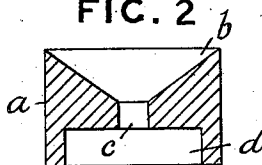


FIG. 4.

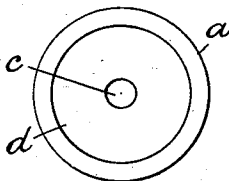


FIG. 7.

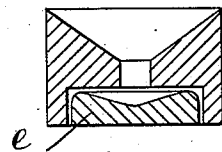


FIG. 5.

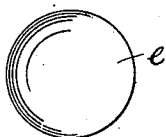


FIG. 8.

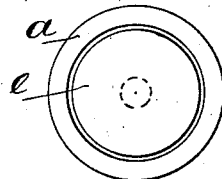


FIG. 6.



FIG. 10.

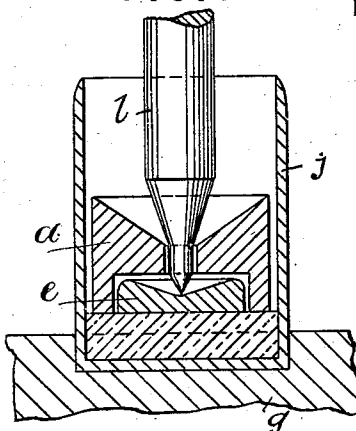


FIG. 11.

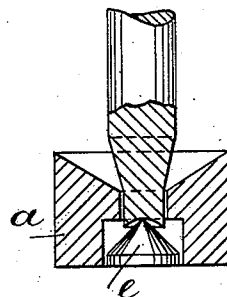
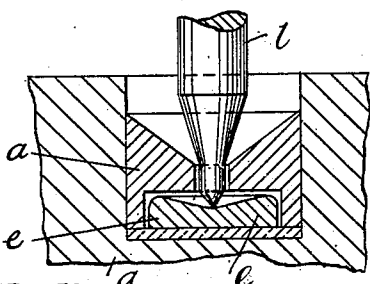


FIG. 9.



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS ASHWORTH, OF URMSTON, NEAR MANCHESTER, ENGLAND.

FOOT-STEP FOR SPINDLES.

SPECIFICATION forming part of Letters Patent No. 727,255, dated May 5, 1903.

Application filed August 27, 1901. Serial No. 73,470. (No model.)

To all whom it may concern:

Be it known that I, THOMAS ASHWORTH, a subject of the King of Great Britain and Ireland, residing at Urmston, near Manchester, in the county of Lancaster, England, have invented a new and useful Improved Foot-Step for Spindles Used in Machines for Preparing, Spinning, and Doubling Cotton and other Fibrous Substances and the Like, of which the following is a specification.

This invention relates principally to an improved foot-step to be used in supporting the foot or lower end of spindles such as are employed in machines for preparing, spinning, and doubling cotton and other fibrous substances; but it may also be used for other like spindles revolving in a vertical position.

In the accompanying drawings, Figure 1 is a side view, Fig. 2 a vertical section, Fig. 3 a plan of the top, and Fig. 4 an inverted plan, of the foot-step *a*. Fig. 5 is a plan, and Fig. 6 a transverse section, of the disk *e*. Fig. 7 is a sectional elevation, and Fig. 8 an inverted plan, showing the disk *e* placed within the foot-step *a*. Fig. 9 is a sectional elevation showing the foot-step *a* fitted in a spindle-rail with a spindle *l* resting on the disk *e*. Fig. 10 is a sectional elevation showing an oil-cup *j* fitted in a spindle-rail *g* and the foot-step *a* and disk *e* placed therein. Fig. 11 shows a modification in the application of my invention.

The invention relates to such spindles as are made with a foot of reduced diameter terminating in a reversed conical point. These spindles are usually provided with a foot-step drilled with a hole corresponding both in form and dimensions with the foot of the spindle, so that the latter just fits the hole, and the consequence is that either the spindle is tight at some part, thus creating unnecessary friction, or that if not tight the spindle is too free and the conical part of the hole becomes worn in the center by the vibration of the spindle, and hence the latter does not run perfectly true, especially at high velocities. To obviate these defects and to insure that the spindle shall run absolutely true without vibration or undue friction, I provide a foot-step, as indicated by *a* on the drawings. I take a cylindrical piece of steel of the proper

depth and diameter for the foot-step required, and in the top I turn a reversed conical recess or cup *b* at an angle of, say, forty-five degrees, or thereabout, and through the center I drill a vertical cylindrical hole *c* quite through of such a diameter as will fit the reduced foot of the spindle and allow it to revolve freely therein. In the under side of the foot-step I form a cylindrical recess *d*—say about one-eighth of an inch in depth, more or less—and I provide a hardened-steel disk of rather smaller diameter, so that when placed in this recess it shall be somewhat loose and capable of a slight amount of movement therein horizontally in any direction. The upper side of this disk has a shallow conical recess *f* formed in the center, the sides of such cone being of a more obtuse angle than the point at the foot of the spindle, so that when the foot of the spindle is placed therein it does not touch anywhere excepting at the extreme point. In the spindle-rail *g* I form a cylindrical hole or recess of such a diameter that the outside of the foot-step will fit tightly therein. I place the disk face upward in this recess and then place the foot-step into the hole above the disk. If the foot of the spindle is now placed in the conical cup at the top of the foot-step, its reduced diameter will pass through the central hole and the extreme point will rest in the conical depression made in the face of the hardened-steel disk below, and this disk being, as before stated, loose in the lower recess of the foot-step can accommodate itself in position to the extreme hardened point of the spindle and keep it absolutely central and perpendicular, so that any tendency of the spindle to vibrate is instantly counteracted and friction is reduced to an almost absolute minimum, and it will be found that oil introduced into the cup-shaped recess on the top of the foot-step will keep the foot and point of the spindle thoroughly lubricated, and the recess in the loose disk being very shallow no dirt can possibly remain in the center thereof, as the centrifugal action of the spindle will throw it out instantly.

In some cases I may place the aforesaid disk *e* and foot-step *a* in an oil-cup *j*, as shown

in Fig. 10, and fit said cup tightly in the spindle-rail, when the foot-step, as well as the disk, would have a slight play laterally.

In a modification of my invention I form the bottom end of the spindle with a shallow conical recess and make the aforesaid disk with a hardened point extending upward, upon which the aforesaid conical recess in the spindle will rest, as shown in Fig. 11.

I claim as my invention—

1. An improved foot-step bearing for spindles, comprising a rail, a spindle having a hardened foot, a foot-step having a cup-shaped upper face and an opening at the bottom of said cup for the foot of the spindle, but of greater diameter than the part of the latter which passes through said opening, a disk under said opening free to move laterally, the bearing-faces of the spindle-foot and disk consisting of a conical point and a shallow recess of a more obtuse angle than the sides of the conical point, all substantially as and for the purpose described.

2. An improved foot-step bearing for spindles, comprising a rail, a spindle having a hardened foot, a foot-step having an opening for the foot of the spindle but of greater diameter than the part of the latter which passes through said opening, a disk under said opening free to move laterally, the bearing-faces of the spindle, foot and disk consisting of a conical point and a shallow recess of a more obtuse angle than the sides of the conical point, all substantially as and for the purpose described.

3. An improved foot-step bearing for spindles, comprising a rail, a spindle having a foot with hardened conical point, a foot-step having a cup-shaped upper face and an opening at the bottom of said cup for the foot of the spindle, but of greater diameter than the part of the latter which passes through said opening, and a disk under said opening free to move laterally, the upper face of the disk having a shallow conical recess of a more obtuse angle than the conical point of the spindle-foot, as and for the purpose described.

4. An improved foot-step bearing for spindles, comprising a rail, a spindle having a foot with a hardened conical point, a foot-step having a cup-shaped upper face, a recess on its under face and an opening at the bottom of said cup for the foot of the spindle, said opening being of greater diameter than the part of the latter which passes through the opening, and a disk in said under recess free to move laterally therein, the upper face of the disk having a shallow conical recess of a more obtuse angle than the conical point of the foot, as and for the purpose described.

5. An improved foot-step bearing for spindles, comprising a rail, a spindle having a foot with a conical point, a foot-step having a cup-shaped upper face and an opening at the bottom of said cup for the foot of the spindle, but of greater diameter than the part of the latter which passes through said opening, a disk under said opening free to move laterally, the upper face of the disk having a shallow conical recess of a more obtuse angle than the conical point of the spindle-foot, and an oil-cup containing said foot-step and disk, all substantially as described.

6. An improved foot-step bearing for spindles, comprising a rail adapted to receive oil, a spindle having a hardened foot, a foot-step having an opening for the foot of the spindle but of greater diameter than the part of the latter which passes through said opening, a disk under said opening free to move laterally, the bearing-faces of the spindle-foot and disk consisting of a conical point and a shallow recess of a more obtuse angle than the sides of the conical point, the foot-step being loose in the oil-cup, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS ASHWORTH.

Witnesses:

THOS. PRESCOTT,
JNO. HUGHES.