(No Model.)

W. F. DRAPER.

SPINDLE AND BOLSTER FOR SPINNING MACHINES.

No. 253,021. Patented Jan. 31, 1882.

Fig: 1.

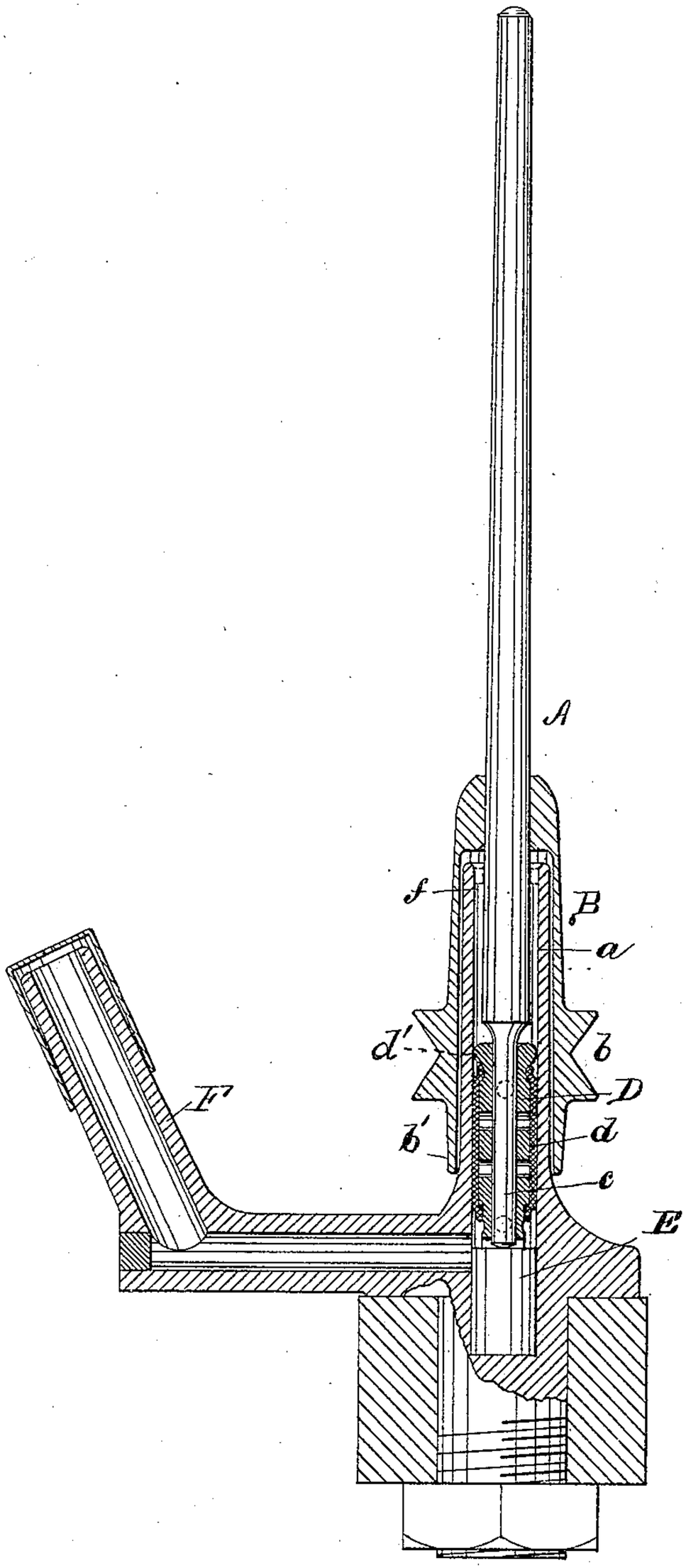
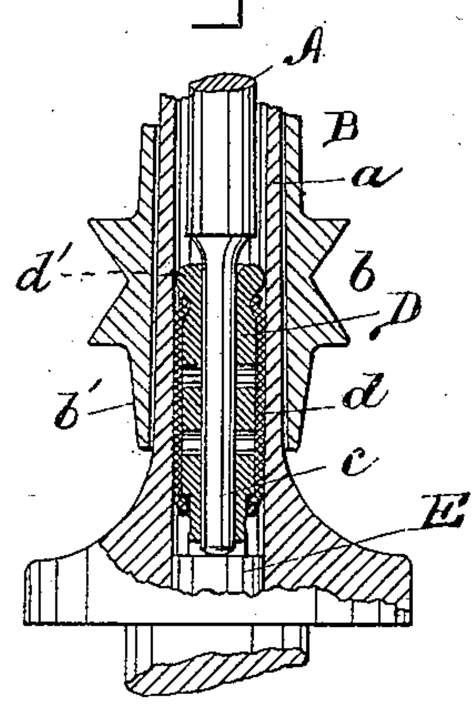


Fig: 2.



Witnesses

Lawrence F. Connor.
Bernice J. Noyes.

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UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS.

SPINDLE AND BOLSTER FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 253,021, dated January 31, 1882.

Application filed June 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. DRAPER, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Spindles and Bolsters for Spinning-Machines, of which the following description, in connection with the accompanying drawings, is a specification.

The spindle hereinafter described is an improvement on the class of spindles which have a downwardly-extending sleeve, to which the band-whirl is attached, said sleeve encompassing a fixed vertical tube, within which is a yielding bolster-bearing for the pintle of the spindle, and which bolster is capable of movement within the bolster-tube, to enable the spindle, untrammeled by any confining footstep, to find its own center of gravity when rotating under an unbalanced load.

In a former application, No. 31,379, for Letters Patent made by me, and filed April 21, 1881, for an improvement in this class of spindles I have shown the center of the band-whirl in substantially the same plane with the foot of the spindle.

In my present invention I have so constructed and arranged the parts composing the spindle that the groove of the band-whirl is located in a plane coinciding substantially with the top of the yielding bolster, as I have found that by so doing the pull of the driving-band on the whirl will not be able to spring or bend the pintle or bearing portion of the spindle in the bolster, and therefore with this construction I am able to reduce this portion of the spindle to a less diameter than has heretofore been practicable. As a result I have diminished greatly the power required to drive the spindle under the ordinary conditions existing in spinning yarn. I prefer with this arrangement to make use of a bolster the upper end of which is rounded and of greater diameter than the portion which is surrounded with the elastic or yielding packing jacket, and the edge of this rounded portion is at its largest diametrical plane in contact with the interior of the fixed bolster-tube, as shown in the drawings; but a cylindrical bolster surrounded by a yielding jacket can also, under an arrangement of the sleeve-whirl relatively to the top of such bolster and to the fixed bolster-tube, as above described, be used to great advantage.

In order to prevent the slender pintle of the spindle from being bent from the effect of extraordinary strain from careless doffing, the spindle-sleeve is extended below the whirl, and the lower edge of this extended portion will, when the spindle is unduly deflected from the vertical, bring up against the fixed bolster-tube, and if the space between the interior of such tube and the exterior of the bolster occupied by a yielding cushion be of proper width, the pintle, however slender it may be made, will be perfectly protected.

Referring to the drawings, Figure 1 represents in partial vertical section a sleeve-whirl spindle, bolster, and tube, with an oiling supply-reservoir attached. Fig. 2 exhibits the same construction with the oil-tube omitted.

A represents the blade, or that part of the spindle which, in spinning, carries the bobbin.

B is the sleeve of the spindle, encompassing the fixed bolster-tube *a*, carrying a grooved whirl, *b*, and having an annular extension below the whirl. The pintle or bearing portion of the spindle is represented at *c*.

D is the bolster, surrounded by a yielding jacket, *d*. The bolster will preferably have an enlarged head, *d'*, with its edge in contact with the interior surface of the bolster-tube, but rounded, so as not to interfere with the oscillation of the spindle in the effort to accommodate itself to an unbalanced load; and E is the support for the foot of the pintle, of such form as not to prevent the movement of the foot radially.

Great practical advantages result from locating the whirl *b* so that the pull of the driving-band will be in a plane coinciding substantially with the top of the bolster. In case a bolster be employed with the enlarged head *d'*, the strain of the band is resisted by the head, which in turn is supported laterally by the fixed bolster-tube *a*, and even in case a cylindrical bolster be used not provided with a head in contact with the wall of the tube, such strain as comes upon the pintle during the spinning operation will be most favorably resisted by it, because it will be sustained near the base of the pintle, or in the immediate neighborhood of its junction with the enlarged spindle-blade, where its capacity to withstand a bending strain is the best. I have tested this construction described, practically, and have

found that I am able to reduce the diameter of the bearing portion of the spindle *c* to less than one-fifth of an inch, although the length of such bearing portion was one and one-quarter inch.

If the whirl were located differently in reference to the bolster, it would be impossible to make spindles for practical use with pintles so slender, on account of their liability to become bent from the effect of the strain of the band when unduly tightened from a contraction under atmospheric changes.

The sleeve B being a part of the spindle and having an annular extension, *b'*, below the whirl concentric with the fixed bolster-tube, and with its inner surface in close proximity to the adjacent exterior surface of the tube, it follows that with a proper relation of the diameter of the cylindrical portion of the bolster to the diameter of the bolster-tube, such as is indicated in the drawings, there will be no danger of bending the pintle *c* from carelessness in doffing.

F, Fig. 1, represents an oil-supply reservoir in common use, and which, when filled with oil, finds its way to the bearing of the bolster. By the construction and arrangement of the parts of the spindle which I have above described the fixed bolster-tube may be extended to a considerable distance above the top of the bolster, forming an annular chamber, *f*, as shown at Fig. 1, so that when the oil-reservoir F is filled the oil will stand in the chamber *f* above the bolster and flood the whole bearing; and to facilitate its rising in the bolster-tube, grooves or channels may be cut through the enlarged head of the bolster in case a bolster with such head be used.

By the term "sleeve-whirl spindle" as herein I mean a spindle composed of a blade for carrying the usual bobbin, of a pintle at its lower end adapted to enter and be supported by a bolster, and of a sleeve constituting a downwardly-extending annular extension to carry the band-whirl. The spindle-bolster employed will be supported in the fixed bolster-tube so as to yield or move freely in the direction of movement of the lower end of the spindle, as the latter, in sliding upon the foot-rest, moves to find the true center of rotation for the spindle and the load carried by it.

I claim—

1. The sleeve-whirl spindle provided with a sleeve-like extension, *b'*, below the band-groove of the whirl, combined with the yielding bolster and its support, the top of the bolster being located substantially in the line of the band-groove of the whirl, whereby the sleeve-like extension below the grooved whirl guards the pintle of the spindle against the effect of strain, tending to deflect the spindle from the vertical, as set forth.

2. The sleeve-whirl spindle having a pintle of smaller diameter than the butt of the spindle-blade, combined with a yielding bolster and supporting tube, substantially as described, the band-receiving groove of the whirl, the top of the reduced part of the spindle or pintle, and the top of the bolster being all located in substantially the same plane, as set forth.

3. The sleeve-whirl spindle, the upwardly-extended tube *a*, and the oil-supply reservoir extended above the plane of the top of the bolster, combined with the bolster shorter than the said supporting-tube, leaving above the bolster a chamber for the reception of oil, substantially as described.

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

WM. F. DRAPER.

Witnesses:

G. W. GREGORY,

W. H. SIGSTON.