(No Model.)

J. BIRKENHEAD.

Mechanism for Supporting the Spindles of Ring Spinning Frames.

No. 234,522. Patented Nov. 16, 1880.

Fig. 1.

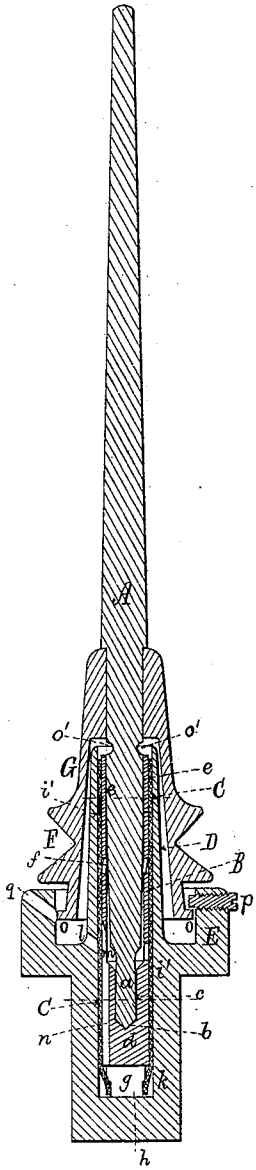


Fig. 2.

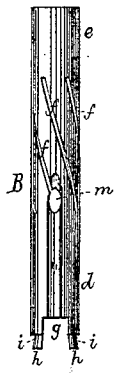


Fig. 3.

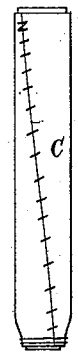


Fig. 6.

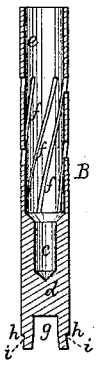


Fig. 4.

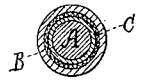
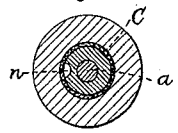


Fig. 5.



Witnesses.
S. N. Piper
W. W. Lunt

Inventor.
John Birkenhead.
by attorney.
R. H. Eddy

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN BIRKENHEAD, OF MANSFIELD, MASSACHUSETTS.

MECHANISM FOR SUPPORTING THE SPINDLES OF RING-SPINNING FRAMES.

SPECIFICATION forming part of Letters Patent No. 234,522, dated November 16, 1880.

Application filed May 10, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN BIRKENHEAD, of Mansfield, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Mechanism for Supporting the Spindles of Ring-Spinning Frames; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a vertical section of a spindle and its sustaining mechanism provided with my invention. Fig. 2 is a side elevation of the combined step and yielding or elastic bolster to be hereinafter explained. Fig. 3 is an elevation of such combined step and bolster and its oil absorbing and elevating sleeve. Fig. 4 is a horizontal section of the combined step and bolster, its sleeve, and their supporting receiver. Fig. 5 is a horizontal section of the combined step and bolster, such section being taken through the step thereof. Fig. 6 is a vertical and transverse section of the combined step and elastic or yielding bolster.

The nature of my invention is fully defined in the claims hereinafter presented.

I carrying out my invention I combine with a combined step and elastic or yielding bolster, a yielding or oil-absorbing and elevating sleeve, encompassing such and serving in and with a socketed receiver to support such combined step and bolster.

In the drawings, A denotes a ring-frame spindle, provided at its lower end with a cylindrical or slightly-tapering pivot, *a*, having a tapering or conical lower end or foot, *b*. This pivot enters a correspondingly-shaped socket or bearing, *c*, made in the step *d* of a combined step and laterally-yielding bolster B, the bolster of which is shown at *e*, as constituting the upper portion of a tube extending upward from the step, and having formed in it between such step and bolster a series or suitable number of helical or inclined slots, *f*, such tube being sufficiently thin to allow the bolster to spring laterally relatively to the step, as may be desirable.

At its lower end the combined step and bolster is chambered or recessed crosswise or furcated, as shown at *g*, and each of the prongs *h* is grooved transversely in its outer surface, as shown at *i*. Encompassing the said combined step and elastic bolster, the bolster of which is to be so adapted to its step as to be free to spring or move laterally a little in radial directions horizontally, is a yielding or capillary attractive sleeve, C, preferably a knit tube or made of cloth, it being at its lower part fastened to the prongs of the step by thread wound around it so as to force it tightly into the grooves of such prongs. This "capillary attractive sleeve," as it may be termed, extends up to the top of the bolster, and, with the combined step and bolster, is inserted within a cylindrical socket, *i'*, made partly in a tubular receiver, D, and also partly in the shank *k* of an oil cup or reservoir, E. The said receiver D is extended up from the bottom of the said reservoir so as to project a short distance above the top of the combined step and yielding bolster when the prongs thereof are resting on the bottom of the socket *i*. There is an object in having the said receiver to so project above both the bolster and sleeve, for, in so doing, it forms around the spindle an annular chamber or space to receive and hold a surplus of oil raised by the sleeve, by capillary attraction or its power of absorption. The said surplus oil answers to keep the sleeve oiled to advantage when the spindle may be at rest. In and around the spindle and on a level with the top of the sleeve is a groove, *o'*, which operates to increase the annular chamber to receive oil.

In the base of the receiver D is a duct, *l*, to lead oil from the oil-reservoir to the sleeve C, and there is also made at the upper part of the step of the combined step and bolster another such oil-duct, *m*, which is arranged in continuation or line with the duct *l*. Furthermore, there extends from the duct *m* a groove, *n*, which is made in the outer surface of the step *d*, and opens into the notch or chamber *g*, such groove serving to freely conduct oil from the reservoir E down into the said chamber *g*, and with the latter to operate to keep saturated, or properly supplied with oil, the part of the sleeve that may encompass the step.

The whirl F, for aiding in revolving the spindle, projects from a hollow conic cap or frustum, G, attached to the spindle and ar-

ranged concentrically therewith and extended down around the receiver D to and into the oil-reservoir E. At its lower end the frustum has a flange, *o*, projecting from it. A screw, *p*, screwed into the oil-reservoir E, so as to project immediately over the said flange, serves with the latter to prevent the spindle and frustum from rising upward while revolving.

An inclined induct, *q*, made in the side of the oil-reservoir, enables it to be supplied with oil as occasion may require.

The neck or shank of the oil-reservoir fits into the spindle-rail of the spinning-frame when the reservoir may be resting upon such rail.

A combined step and elastic bolster, as represented in the accompanying drawings, and provided with a cloth or yielding sleeve arranged thereon, as herein described, differs materially from a cylindrical tube disconnected from a flat-topped step and surrounding the spindle and having a bore corresponding in diameter throughout to the part of the spindle within it, such step and tube being surrounded by a cloth or yielding sleeve, for the combined step and elastic bolster are not disconnected or made so that the spindle at its foot can have any lateral movement on or independently of the step, the latter being cupped or socketed to receive and fit to the pivot of the spindle, the fitting of the two being sufficiently loose to allow oil to get between them and also admit of the spindle moving laterally with the bolster. By providing the spindle with a pivot and socketed step as described such spindle becomes not only differently supported and incapable at the lower end of its pivot from moving laterally or gyrating upon the step, but is kept lubricated to better advantage.

With my combined step and elastic bolster and the surrounding yielding sleeve the step can move laterally with the pivot of the spindle, which is not the case when the spindle at its foot rests on the flat top of a step disconnected from a tube extending up therefrom and serving as a bearing to the entire portion of the spindle encompassed by it.

There is advantage in having the step so movable with the spindle when such step is combined with a yielding bolster, for with such the spindle can yield laterally, as may be required, and not unevenly wear its step, as it would be liable to do were the step separated from the bolster and not socketed to receive the spindle; and, besides, with the combined step and elastic or yielding bolster and their encompassing sleeve, the bolster, as occasion may require, can yield laterally independently of the step.

With the improved spindle and its supports and oil-reservoir, as set forth, the bearing-surfaces of bolster and step and the spindle are kept very freely and uniformly oiled, and the combined step and elastic bolster rendered capable of lateral movement with the spindle to enable the latter, while in rapid revolution, to adjust itself into a vertical position, and besides the sleeve is maintained with great effectiveness freely charged with oil, even while the spindle may be at rest; and as there is no chance for the foot of the spindle to move laterally or gyrate on its bearing in the step, such foot is not liable to wear such step unevenly; nor is the spindle so liable to "wabble" or gyrate as it would be were it at its foot to rest on a flat step disconnected from a bolster or tube over such, and serving to support the spindle and capable of moving laterally independently of the step. Furthermore, the spindle, being slightly tapering from the bolster down to the step, has, in reality, no bolster-bearing continuing from the step up to the top of the bolster; but between the bottom of the bolster and the step the spindle is not in contact with the tube surrounding it, (though it may be sufficiently near for it to, and with the helical grooves to elevate oil,) such admitting of the bolster operating to advantage.

What, therefore, I claim as my invention is as follows, viz:

1. The combination of a combined step and elastic bolster with a yielding sleeve encompassing such and to support the same in and with a sustaining socket or receiver, as set forth.

2. The combination of a combined step and elastic bolster provided with one or more helical slots arranged therein above the step, as represented, with a capillary or absorbent sleeve encompassing such combined step and bolster, and also with a sustaining-socket provided at its base with an oil-reservoir, whereby oil from said reservoir by such sleeve will be elevated around the external surface of such combined step and bolster and fed into its helical groove or grooves, as specified.

3. The combined step and elastic bolster provided at its lower end or part with the oil-receiving recess or chamber *g*, and with the side passage or groove, *n*, leading upward therefrom, as set forth.

4. The combined step and elastic bolster provided at its lower part with the sleeve-sustaining grooves *i*, the oil chamber or recess, *g*, and the lateral duct or groove *n*, such duct being to communicate with the oil-reservoir, as set forth:

5. The combined step and elastic bolster provided at its lower end with the oil-receiving recess or chamber *g* and with the lateral passages *m* and *n*, arranged as set forth.

6. The combined step and bolster provided with the capillary or oil-absorbing sleeve, the recess *g*, and the lateral passages *m n*, all arranged substantially as set forth.

7. The combined step and elastic bolster provided with one or more inclined slots, an oil-chamber, *g*, and passages *m n*, as set forth, in combination with the capillary or oil-absorbing sleeve encompassing such combined step and elastic bolster, and also with the sus-

taining-socket of said sleeve, and an oil-reservoir communicating with the sleeve, whereby oil may be raised thereby from said reservoir to the combined step and elastic bolster, as specified.

8. The combination of the spindle provided at its lower end with the pivot *a*, with a cup-step and a yielding bolster, and a socket-receiver therefor, and with a yielding sleeve arranged in such receiver and encompassing the step and bolster, all substantially as specified.

9. The combination of the elastic or yielding bolster and its capillary attractive sleeve with the socketed receiver thereof, extended above the tops of both bolster and sleeve, as and for the purpose set forth, and also with an oil-reservoir arranged with the sleeve and receiver and opening through the latter, substantially as specified.

10. The combination of the spindle provided with the transverse groove *o'*, with the combined step and bolster, and the yielding or capillary attractive sleeve, arranged as set forth, and with their receiver extended above the tops of both bolster and sleeve, as described.

JOHN BIRKENHEAD.

Witnesses:
R. H. EDDY,
S. N. PIPER.