JOHN DODD.

Improvement in Self-Acting Mules for Spinning.

No. 114,274. Patented May 2, 1871.

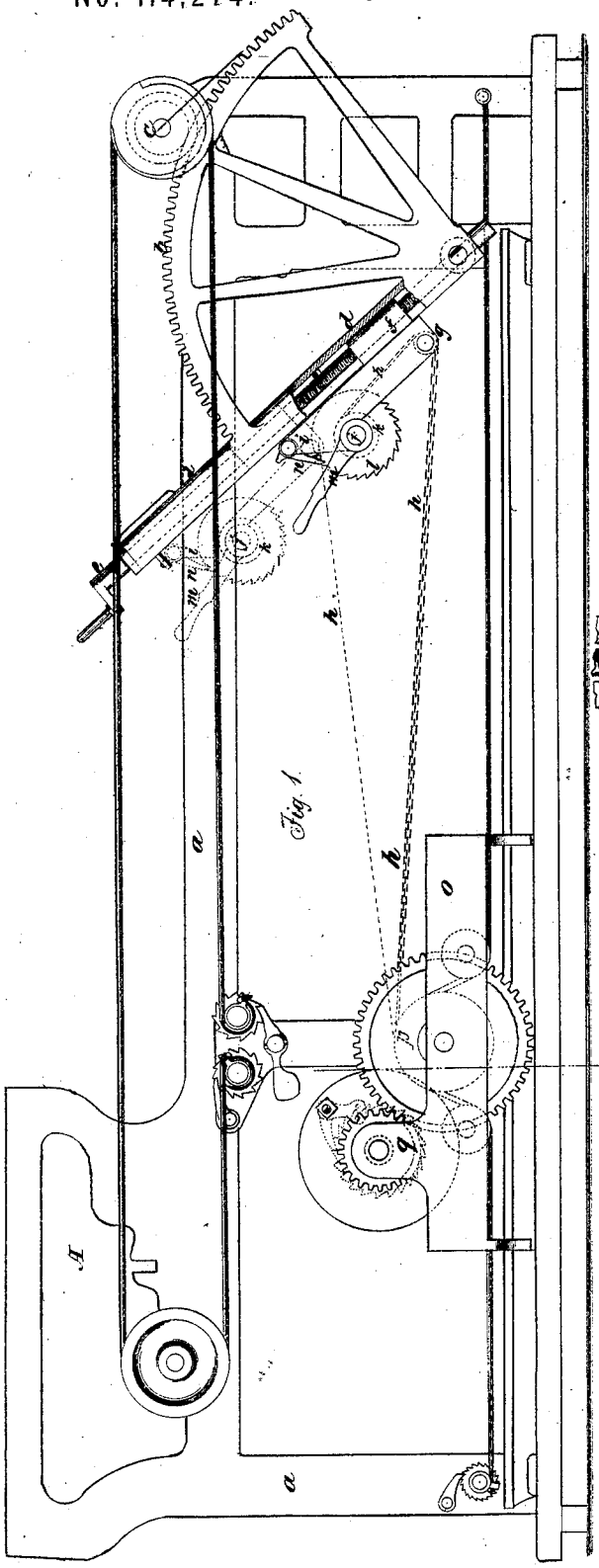

Fig. 1.

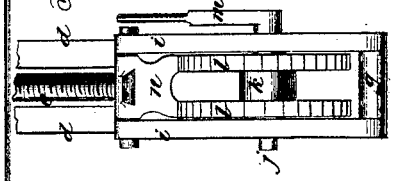

Fig. 3.

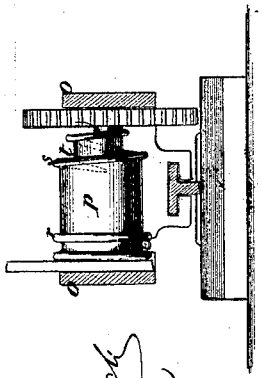

Fig. 2.

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JOHN DODD, OF OLDHAM, ENGLAND.

Letters Patent No. 114,274, dated May 2, 1871.

IMPROVEMENT IN SELF-ACTING MULES FOR SPINNING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN DODD, of Oldham, in the county of Lancaster, in Great Britain, have invented certain Improvements in Machinery for Spinning and Doubling Cotton and other Fibrous Materials; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

My invention refers to that part of the self-acting mule or twiner known as the winding-on motion, and is designed to impart an increased velocity to the spindles when the yarn is being wound on a tapered portion thereof and the cop-nose is being formed.

The arrangement most commonly in use for winding on is that of the quadrant or radial-arm winding-on chain, and it is to these parts that my invention has reference.

To accomplish the object of my said invention I employ the ordinary winding-on drum, but form upon one end thereof a scroll, gradually decreasing in diameter in proportion to the required differential motion of the spindles, and I provide means for taking up any length of chain, so that it may be unwound from the said scroll when desired, or from a portion thereof.

In the accompanying drawing—

Figure 1 represents a partial view of a mule in cross-section with my improvements adapted;

Figure 2, a detached view of the winding-on drum; and

Figure 3, a detached view of the radial arm.

Similar letters of reference indicate corresponding parts.

The frame-work of the mule is shown at *a*, the end A being the roller-beam end thereof.

Upon this frame is mounted the usual quadrant *b*, to which motion is communicated from the shaft *c*, and at *d* is the radial arm.

At *f* is the nut, which is traversed in the ordinary manner by the screw *e*, and at *g* is what may be considered the usual point of attachment for the winding-on chain *h;* but according to my invention this part of the machine is constructed in a peculiar manner.

Within an extension, *i*, of the nut is mounted a short shaft, *j*, upon which is a pulley, *k*, and upon the same axis are ratchet-wheels *l*, and also a lever-handle, *m*.

The part *i* carries a clinch, *n*, which prevents the ratchet-wheel from turning in one direction, but leaves them free to do so in the other.

At *o* is the carriage, within which is mounted, as usual, the winding-on drum *p*, and which communicates motion to the tin drum *q* in the ordinary manner.

The winding-on drum *p* is constructed as a cylinder from *r* to *s*, and so far it is as usual; but according to my invention one end thereof is provided with a scroll, *t*, tapering toward one end.

The winding-on chain is attached to the smaller end of the scroll *t*. It is then coiled around the said scroll, and subsequently around the parallel part of the drum. From thence it passes over a roller, *g*, then extends upward, and is made fast to the pulley *k*.

The operation is as follows:

According to the position of the parts shown, the winding on, in order to form a cop, is just commencing, the nut *f* being at the bottom of the radial arm. as usual.

The machine being now put in motion, the spinning and winding on will go on in the ordinary manner, the nut *f* being traversed by the screw *e* until it arrives at the position shown by the dotted lines, by which time the base or full diameter of the cop will have been attained, and the operation will then go on, as is well understood, until the nose of the cop is being formed, at which time my invention is particularly designed to come into operation, although it may be varied in this particular, as will hereinafter be mentioned.

During the operations above alluded to the chain *h* has been unwound from the parallel part only of the drum *p*, a sufficient length of the said chain being wound thereon to prevent the motion of the carriage from causing it to proceed from the scroll *t*, but that part of the apparatus now comes into operation.

Suppose the spindles to continue to revolve at the same speed as they have hitherto done, their gradually-decreasing diameter would not afford a proportionate winding-on or taking-up power, a deficiency which, as is well known, leads to a looseness in the formation of the nose of the cop, and to remedy which my invention is designed, and operates in the following manner:

The attendant, by means of the hand-lever *m*, turns the pulley *k* a portion of a revolution, by which means a certain length of chain is drawn off the drum *p* and is wound upon the pulley *k*, and the length of the said chain between the point *g* and the drum *p* is necessarily shortened. When, therefore, the carriage runs in there will not be sufficient length of chain to remain upon the parallel part of the drum, and it will of necessity pass onto a portion of the scroll *t*, which, being of smaller diameter than the driving surface hitherto used, will impart an increased rate of speed to the spindles in proportion to their decreasing diameter.

As the work goes on the attendant occasionally (as he may see necessary) winds further lengths of chain upon the pulley *k*, by which means the several shortenings of the chain cause it to be unwound from successively-decreasing diameters of the scroll *t*, and thus the operation goes on until the cop is completed.

I have above particularly alluded to my invention as coming into operation for forming the nose of the cop, that being the point of greatest importance, but it will be evident that, if desired, the scroll may be brought into operation at an earlier stage of the formation of the cop, in order in like manner to compensate for the taper of the spindle at lower positions.

I am aware that scrolls have heretofore been formed upon winding-on drums, and therefore lay no claim thereto; but

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

The combination of a winding-on drum with decreasing diameters with apparatus substantially such as herein described, connected to the radial arm, for removing lengths of chain from the said drum.

The above specification of my invention signed by me this 28th day of November, 1870.

JOHN DODD.

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