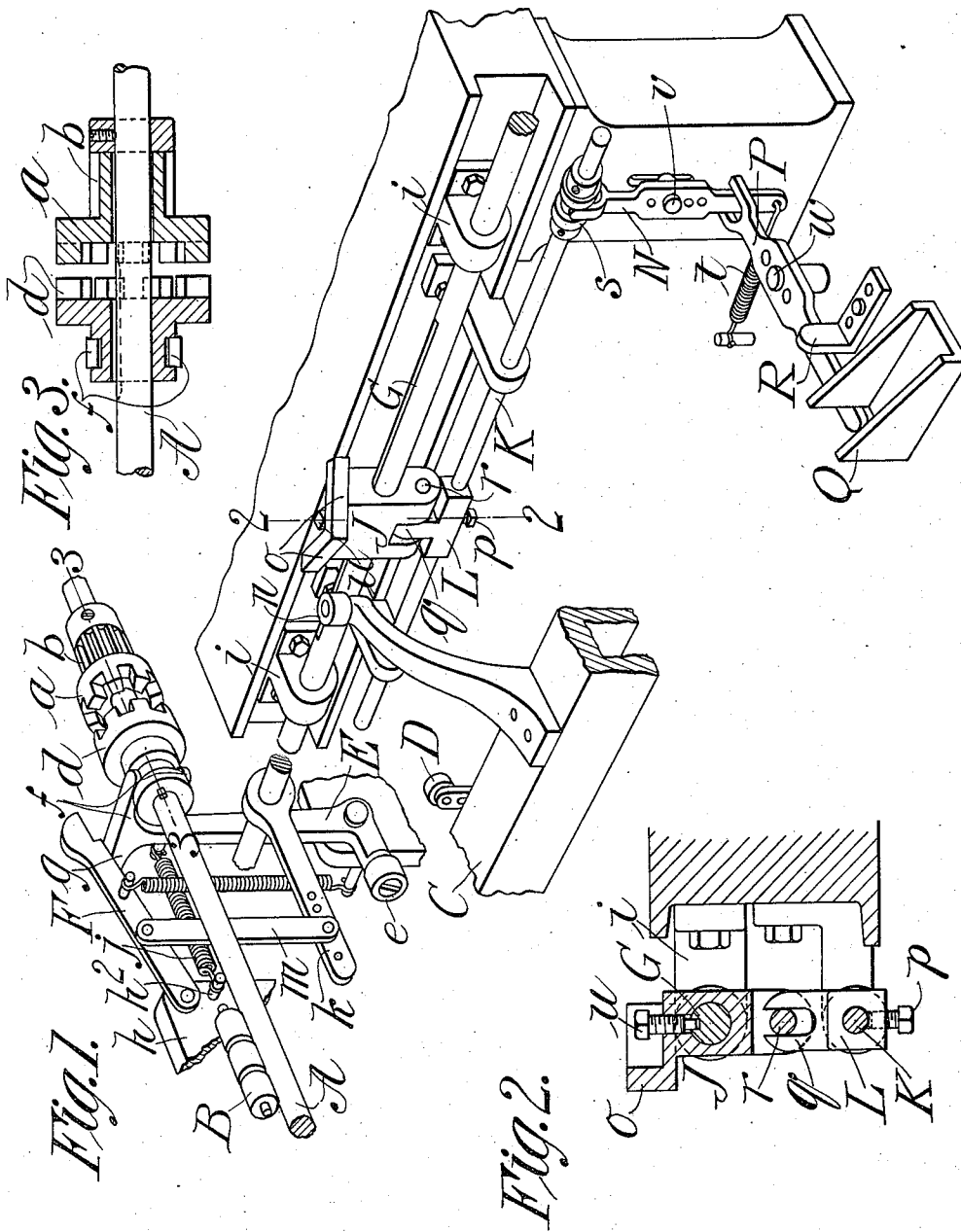


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YARN EVENING ATTACHMENT FOR SPINNING MULES.
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1,014,299.

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WITNESSES:

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YARN-EVENING ATTACHMENT FOR SPINNING-MULES.

1,014,299.

Specification of Letters Patent.

Patented Jan. 9, 1912.

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To all whom it may concern:

Be it known that I, ROBERT J. HARRINGTON, a citizen of the United States of America, and resident of Dalton, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Yarn-Evening Attachments for Spinning-Mules, of which the following is a full, clear, and exact description.

This invention relates to a mechanism or combination of devices for spinning mules having for its object the production of yarn from delivered rovings of uniform size, twist and strength at all times in the working of the mule.

Under the operation of the mule to produce and build yarn on bobbins, while the yarn is built onto the upper conical ends of the bobbins, there is more or less "throw off" of the yarn so that instead of its being wound on the bobbins it flies over the upper ends thereof whereby consequently there is a tendency in the latter period of the building of the yarn onto the bobbin for a lessened drawing and twisting of the yarn, leaving it of coarser character than that which is filled upon the greater portion of the height of the bobbin.

In other words, the object of the present invention is to provide a means for the accomplishment of the object described and explained in Letters Patent of the United States granted to me, dated Dec. 29, 1908, No. 907,792; but in the present case the means for the obtaining of the even yarn production to be built upon all portions of the bobbin is constituted by widely different and simpler means than that described in my aforementioned Letters Patent of the United States. And my new and improved means for the stated purpose is hereinafter described in conjunction with illustrations of so much of a spinning mule as necessary to render the same clear, and is succinctly set forth in the claims.

In the drawings:—Figure 1 is a perspective view of my improved devices; Fig. 2 is a vertical cross sectional view on a somewhat enlarged scale, on line 2—2, Fig. 1, showing details of construction comprised in the novel devices; Fig. 3 is a partial sectional view longitudinally through the clutch mechanism for the roving delivery rolls taken on line 3—3, Fig. 1.

In the drawings, A and B represent the usual roving delivery rolls of the mule lo-

cated at the head or front of the machine, the roll A being intermittently rotated in the usual manner by being periodically put into clutch with the member *a* which has a constant rotary motion. The clutch member *a* which is loosely mounted on an extension of the shaft A is made as one with a pinion or small gear wheel *b* understood as having in mesh therewith gearing operated from a suitable driving means therefor and as usual in most spinning mules. The clutch member *d* is understood as having a spline engagement with the shaft A so that when the member *d* is slid to clutch with the clutch member *a* the shaft must rotate, but so that when the clutch member *d* is withdrawn from the part *a* such member *d* and the shaft will be at rest.

C represents a small portion of the carriage of the mule, the same being understood as having its usual outward course in a direction at right angles to the lengths of the roving delivery rolls A and B and a returning course toward such rolls.

The carriage has a member, here represented as a roller D, adjustably mounted thereon and arranged for coaction with a roller *e* on the lower member of an angular lever E, which is provided with a clutch operating yoke *f*; said lever, furthermore, being provided with a forward extension *g* to receive engagement therewith of the clutch locking lever F, which is represented as pivoted to a stationary part *h*, of the mule frame and is adapted to swing so that its shouldered free end will engage the clutch yoke extension *g* and hold the clutch member *d* in clutch with the clutch member *a*, and thereafter to be disengaged from such clutch locking engagement. The spring *j* connected to the lever E and to a stud *h*² on the fixed part *h* of the frame is operative to normally withdraw the member *d* out of clutch at times when such member is not positively forced into clutch, and held locked.

G represents a shaft arranged at the rearward of the delivery rolls and at right angles thereto, mounted for a rocking movement in the brackets *i i* supported on the stationary part of the mule frame, such shaft being provided with a lever arm *k* which, by link *m* is connected with the clutch locking lever F. A block J is mounted on the rockshaft, and it has a cam face *o* to be impinged against by a roller *n* on a bracket upstanding from and in suitable po-

sition on the mule carriage C. When the mule carriage has its inward motion, that is one toward the roving delivery rolls, its member D will exert a cam-like action on the roll provided arm of the angular lever E, with the effect of so swinging such lever that the clutch member *d* will be thrown into the clutch member *a*, and concurrently therewith the locking lever F will acquire its engagement with the clutch yoke extension *g* and hold the parts in clutch. When the carriage has its outward course in a direction away from the delivery rolls, the member D will pass away from engagement with the clutch operating lever E, although the parts will remain in clutch until the bracket carried roller *n* rises in proximity to and impinges against the cam faced edge *o* of the block J, whereupon the block will be swung rearwardly and the shaft G will be correspondingly rocked to elevate the arm *k*, and through its link force the clutch locking lever F to its free position, leaving the clutch member *d* free to be,—as it will be,—drawn out of clutch by the spring *j*.

In the description so far given, I have not referred to the means whereby a gradually lessening periodicity of the clutch condition and correspondingly gradually lessening amount of roving delivery is acquired to correspond with the portion of the operation of the mule when the yarn is being built on the upper conical or attenuated end of the bobbin or cop; and such means will be now particularly pointed out: Below the rockshaft G is a shaft K, slidable through bracket supports therefor, parallel with the length of the rockshaft G. This slide shaft K has a block L adjustably confined thereon by set screw *p*, and it has an upstanding bifurcated portion *q* which enters a recess in a depending portion of the cam provided block J, and has in effect an engagement with said block by straddling the pin *r* which passes through the opposite walls of the recess and across the aperture upwardly into which the bifurcated part *q* of the block L extends. With the grooved collar *s* affixed on the slide rod K engages the upper yoke formed end of an upright lever N which is intermediately pivoted and has a spring *t* for exerting a draft on the lever in a manner to normally swing the lever and force the slide rod rearwardly. The lever N is engaged by an intermediately pivoted lever P arranged to swing in a horizontal plane and to be subjected to the action of the builder shoe Q. This part Q is understood as the usual builder shoe common in nearly all mules, and has a sliding movement on the floor under the mule for an advancing movement corresponding to the progression of the spinning and the increasing of the quantity of the yarn on the bobbins; and further illustration and particular

description of the builder shoe is considered neither necessary or desirable, although it will be stated that for a greater portion of the time of the operation of the mule the builder shoe will have a position rearwardly withdrawn from the location of the lever P, but will gradually approach the latter. And, therefore, proceeding from the time of the starting of the yarn building on the bobbins, the actions of the coacting parts for alternately clutching and unclutching the roving delivery mechanism will be uniform as in respect of their time and period throughout the greater course of the operation of the mule; but when the bobbin is nearly filled, there remaining only to build the yarn in conical form and with lessening quantity at the upper part of the bobbin, and when the builder shoe shall have come to contact with the lever P, then each successive operation of the mule causing the further advancing of the builder shoe will correspondingly result in increasingly swinging the lever P, gradually advancing the slide rod K and with it the block J,—which, as before stated, has a spline engagement on the rockshaft G,—so that by the positioning of such cam face nearer the head of the machine it will be more quickly reached on the outer course of the carriage and have imparted its swinging movement, causing, likewise, the swinging movement of the rockshaft G, and through the connections *k* and *m* the releasing of the locking lever F so that by the spring *j* the roving delivery mechanism will be thrown out of clutch and rendered idle.

R represents a device of angular shape understood as having its position on the floor alongside the builder shoe and adjustable toward or rearwardly from the arm of the lever P which is engaged by the builder shoe. By the provision of this device R, the normal position of the lever and of the parts controlled by it may be determined and so that the time when the builder shoe will come into coaction with the lever for the before explained effects may be comparatively soon or late in the operation of the mule as occasion therefor may require.

There may be times and conditions in the operation of the mule when my "yarn evener attachment" may not be employed, in which case the block J having the cam edge *o* will be rigidly secured against movement on the rockshaft by the simple expedient of the set screw *u*.

The slide rod lever N is represented as having a series of perforations along the length thereof through any of which the adjustable fulcrum stud *v* may be engaged; and the lever P which coacts with said lever N and which is actuated by the builder shoe likewise has a series of perforations along its length through any of which the ful-

crum stud *w* may be passed; and so in consequence of said capabilities of adjustment the degree of the variation of the roving delivery periods in the final part of the building up operation may be modified so as to be extremely gradual or quite marked.

Various changes in the form, proportion and minor details of construction may be resorted to without departing from the principles or sacrificing any of the advantages of this invention for yarn evenner attachments for spinning mules.

I claim:—

1. In a spinning mule, the combination with the builder shoe and the roving delivery-controlling clutch mechanism, of a mechanism controlling the operation of such clutch mechanism comprising a rockshaft having a lever which coacts with the clutch mechanism and having a cam surfaced part non-rotative relatively to, but slidable along, the rockshaft, and a member on the backwardly and forwardly moving carriage of the mule for successively engaging said cam surfaced member and means automatically controlled by the position of the builder shoe for varying the position of said cam surfaced member relatively to the zone of travel of the said member provided on the carriage.

2. In a spinning mule, in combination, a movable clutch member comprised in the roving delivery mechanism and a yoke-provided lever engaging said clutch member, a locking lever for engagement with and disengagement from the clutch lever and a spring for forcing the clutch to opened position, a rockshaft having a cam surfaced member non-rotatively but slidably engaged

thereon and having a lever arm, a link connecting said lever arm and said locking lever, the carriage of the spinning mule having a member coacting with the yoke-provided clutch operating lever and having a member coacting with said cam surfaced member, a slide rod having a part thereon engaging the cam surfaced member, a lever engaged with the slide rod, another lever coacting with the slide rod engaging lever and the builder shoe across the path of movement of which the last named lever is extended.

3. In a spinning mule, in combination, a movable clutch member comprised in the roving delivery mechanism, a lever for operating the movable clutch member, a member on the carriage coacting with said operating lever, a locking device for the clutch operating lever, a rockshaft having an arm connected with said locking device, a cam surfaced block having a sliding engagement along the rockshaft, and provided with a stud, another member on the carriage whereby in the traverses of the latter it engages said cam surfaced block, and through the latter rocks said shaft, a slide rod having a member extending therefrom and having an apertured portion, the opposite walls of which engage said stud of the cam surfaced block, the builder shoe and slide rod actuating mechanism, one of the movable parts of which is arranged across the path of movement of the builder shoe.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

ROBERT JOSEPH HARRINGTON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."