

(No Model.)

2 Sheets—Sheet 1.

J. M. DUNHAM & J. McKEMMIE.
DRAWING HEAD FOR FIBROUS MATERIAL.

No. 460,083.

Patented Sept. 22, 1891.

Fig. 1.

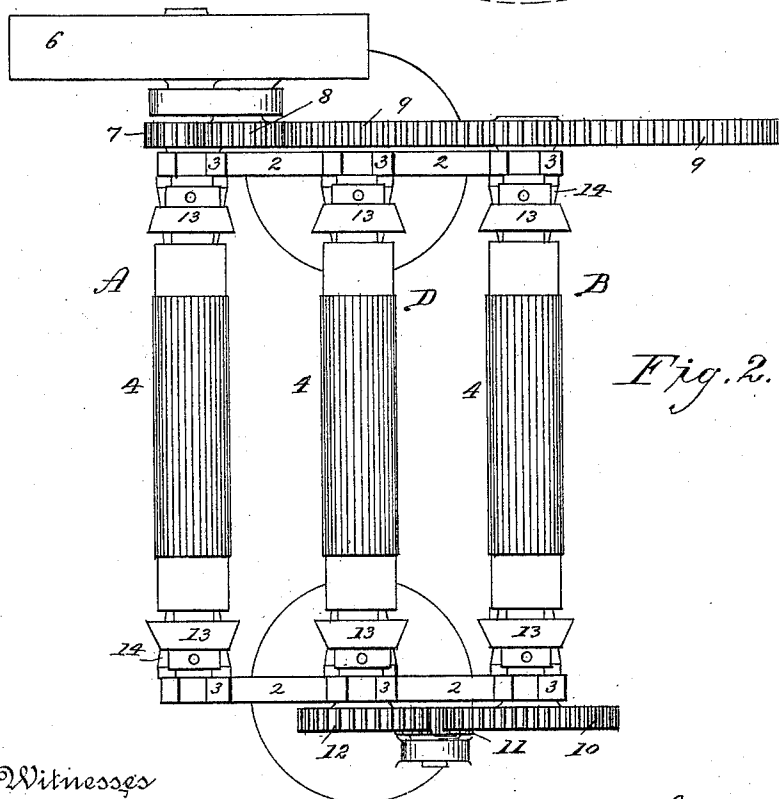
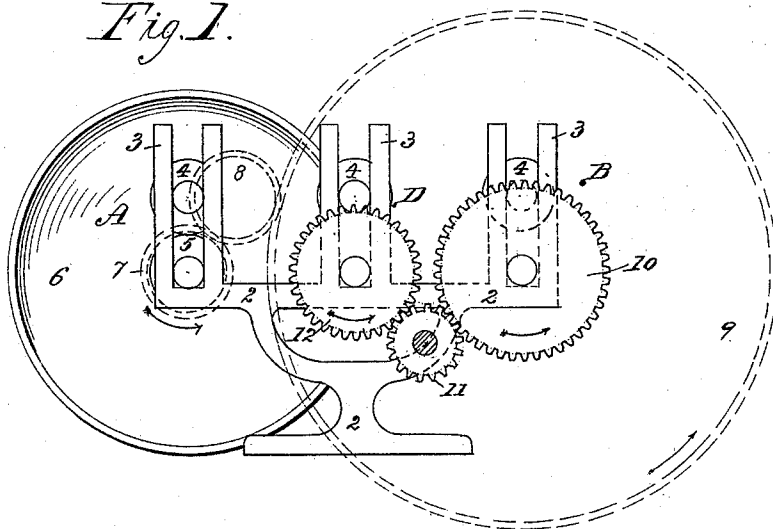


Fig. 2.

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John McKemie,
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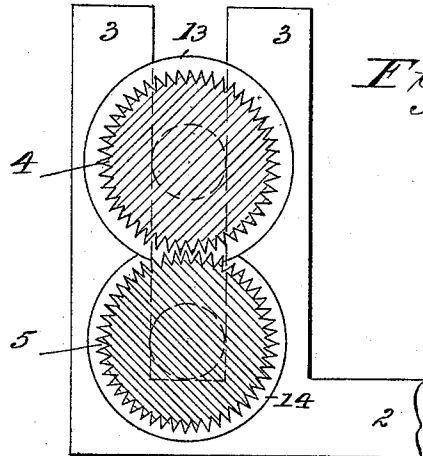
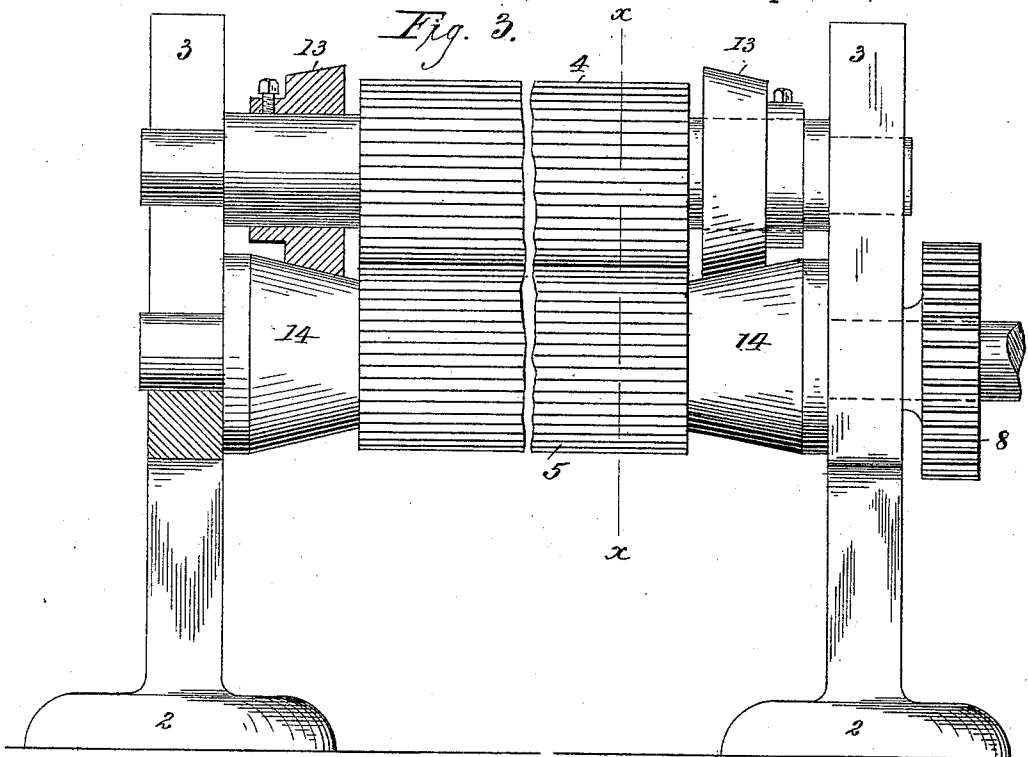
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UNITED STATES PATENT OFFICE.

JOSEPH M. DUNHAM AND JOHN MCKEMMIE, OF HOLYOKE, ASSIGNORS TO THE METALLIC DRAWING ROLL COMPANY, OF INDIAN ORCHARD, MASSACHUSETTS.

DRAWING-HEAD FOR FIBROUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 460,083, dated September 22, 1891.

Application filed September 3, 1888. Serial No. 284,430. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH M. DUNHAM and JOHN MCKEMMIE, citizens of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Drawing-Heads for Fibrous Material, of which the following is a specification.

This invention relates to drawing-heads for elongating, evening, and reducing slivers of fibrous material preparatory to spinning or twisting the same; and the invention consists in certain improvements in the construction of said heads and in the combination, with fluted or grooved and ribbed metallic drawing-rolls adapted to interlock with each other during their rotation, of improved means for supporting said rolls in relative operative positions while said sliver passes between them, all as hereinafter fully described, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation, and Fig. 2 a plan view, of a drawing-head containing three pairs of drawing-rolls embodying our improvements. Fig. 3 is an elevation showing the sides of one pair of said rolls—that is to say, the front pair of the drawing-head, looking from the rear end thereof—said figure showing certain parts in section and one journal of the lower roll broken off, all as hereinafter fully described. Fig. 4 is a transverse section of a pair of the rolls about on line *x x*, Fig. 3, this figure showing also a portion of the drawing-head frame supporting the journals of the rolls.

In the drawings, 2 indicates the drawing-head frame, having thereon several pairs of vertical uprights 3, between which the journals of the drawing-rolls are supported and rotate.

In the drawings, 4 and 5 represent, respectively, the upper and lower rolls of each pair of drawing-rolls in the head, the said rolls being supported to rotate substantially as shown in Figs. 1, 2, 3, and 4, with their journals between the uprights 3 of the frame. The rear pair of rolls B, or those between which the sliver first enters, rotate the slowest. The intermediate pair D rotate a little

faster than the rear rolls B, and the front or delivery rolls A rotate much more rapidly than either of the other of said pairs. The said increasing rapidity of rotation of the drawing-rolls is provided for in order that the sliver of cotton or other material operated upon by the rolls of the head may be treated by each pair thereof in a manner relative to its volume or thickness and to the degree of “drawing” or elongation required to gradually and properly reduce its thickness in passing through the head to fit it to be spun or twisted into even yarn, said delivery-rolls A acting upon the sliver in its most attenuated state to deliver the same to spinning or twisting mechanism, whereby it is spun into yarn. To this end the highest speed is given to the front or delivery pair A of the rolls, the lower one of the latter having a driving-pulley 6 fixed on one end thereof and having a pinion 7 thereon, which engages, through an intermediate pinion 8, with a much larger gear-wheel 9, which is fixed on the rear lower roll of the pair B, and on the opposite end of said rear lower roll is fixed a pinion 10, which engages by an intermediate pinion 11 with a smaller pinion 12, fixed on one end of the lower roll of the pair D. Thus the aforesaid graduated and varying speeds of the several pairs of the drawing-rolls are produced. The said several gears and pinions are fully shown in their relations to each other and to the said drawing-rolls in Fig. 2, and in Fig. 1 the gears and pinions on the front side of the head are shown in full lines and those on the rear side are so shown in dotted lines as to clearly indicate to one familiar with such machinery the above-described manner of their application to the said rolls. The drawing-head is run by a driving-belt applied to said pulley 6 on one end of the lower one of the delivery-rolls A.

Heretofore it has not been deemed practicable to construct a drawing-head for fibrous materials in which the most rapidly-revolving rolls, or those which act finally upon the sliver before it is spun, are both of metal and have such form of interlocking ribs and grooves, as is essential to their proper functions, as drawing-rolls acting upon an attenuated or very thin sliver; but the delivery-rolls of

drawing-heads heretofore generally in vogue consist of a bottom metal roll having shallow flat-bottomed longitudinal channels or grooves in its face and a leather-covered top roll resting on said bottom roll and caused to press hard thereagainst to make it bite the sliver passing between said rolls by hanging heavy weights thereon.

In the use of the improved delivery-rolls herein described the great expense of constant renewal of the leather covering of the top rolls (amounting to an enormous sum in this country annually) is entirely obviated, and a further great saving in power is effected by the use of applicants' rolls, for in practice no weights are hung on the delivery-rolls of the drawing-head and very little, if any, is applied to the receiving and intermediate rolls thereof. By carefully constructing the said grooved and ribbed rolls we have succeeded in successfully operating upon a very large scale drawing-heads consisting of several pairs of metal rolls having ribs and grooves of the shapes shown, it being noted that the height of each rib is greater than its width, thereby providing for an effective folding engagement of the sliver therewith, all substantially identical in construction, and including the delivery-rolls of the head, and said heads have for some time been practically in use in drawing slivers for the production of very fine cotton yarn. The said several pairs of the drawing-rolls of the head may be run, if desired, with the upper roll of each pair resting upon the lower roll thereof in such a way that the edges of the ribs of one roll extend to and have a bearing against the bottom of the grooves of the other roll; but the preferable arrangement of said rolls relative to each other is that below described, wherein the top roll of each pair is adjusted to run more or less separated from the lower roll, whereby any possible injury to the sliver by crushing or cutting is obviated.

The means for maintaining the rolls 4 and 5 of each pair in such positions that their axes are separated to such a degree that the edges of the ribs of one roll do not reach the bottoms of the grooves in the other roll, and whereby said degree of separation may be more or less, according to the thickness or volume of the sliver being operated upon, are as follows: One of said rolls (preferably the upper one 4) has a circular collar 13, adjustably secured on each end thereof by a set-screw or other suitable means, as shown, whereby either of said collars is permitted to be adjusted longitudinally on that part of the upper roll between its grooved portion and the inner side of the vertical uprights 3. The said collars 13, one of which is shown in section in Fig. 3, have their peripheries inclined to the axial line of the roll on which they are

secured. The lower roll of the pair, as shown in said Fig. 3, has that portion 14 thereof between its grooved central part and the adjoining inner sides of the said vertical uprights 3 of the drawing-head frame turned to a conical form, whereby those portions of the roll are given an incline relative to the axis thereof corresponding to the said inclined peripheries of the said collars 13 on the upper roll, the latter-named collars bearing upon the said inclined portions of the lower roll and serving to hold the upper roll, so that the axes of the two rolls are separated, as shown in Fig. 4, and the degree of said separation of the axes is made variable by adjusting the collars 13 to different positions on the upper roll, whereby their peripheries are made to bear against the said conical portions 14 of the lower roll near to or removed from the grooved central portion of the latter. The said lower roll 5 may have the said inclined-faced collars 13 applied thereto, instead of turning the portions thereof tapering, against which said collars bear, as above described, if desired.

The projecting end of the roller-journal (shown broken off in Fig. 3) is that on which the driving-pulley 6 (shown in Fig. 2) is secured.

What we claim as our invention is—

1. A drawing-head for elongating the sliver of fibrous materials, consisting of a pair of interlocking ribbed and grooved metal rolls having coinciding rotary motion, and the final drawing action upon a sliver in its most attenuated state and delivering the same in condition to be twisted, combined with one or more pairs of like metal rolls, between which said sliver passes prior to reaching said delivery-rolls, the upper roll of each pair of rolls resting by its own weight upon the lower roll and the sliver or roving passing between the rolls, a suitable frame in which said rolls rotate, and mechanism, substantially as described, for imparting the requisite rotary motions to said rolls, substantially as set forth.

2. A pair of drawing-rolls for fibrous material, having longitudinal ribs and grooves normally interlocking with each other during their rotation, one of said rolls having longitudinally-adjustable collars thereon having inclined peripheries, substantially as described, and the second of said rolls having inclined bearing-surfaces thereon for the peripheries of said collars, whereby the axes of said rolls may be maintained at varying degrees of separation, substantially as set forth.

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