

No. 647,138. Patented Apr. 10, 1900.  
T. HOLMES, J. KITCHIN & S. HARGREAVES.  
MACHINERY FOR SPINNING, DRAWING, DOUBLING, AND TWISTING TEXTILE YARNS.  
(No Model.) (Application filed Dec. 28, 1898.)

2 Sheets—Sheet 1.

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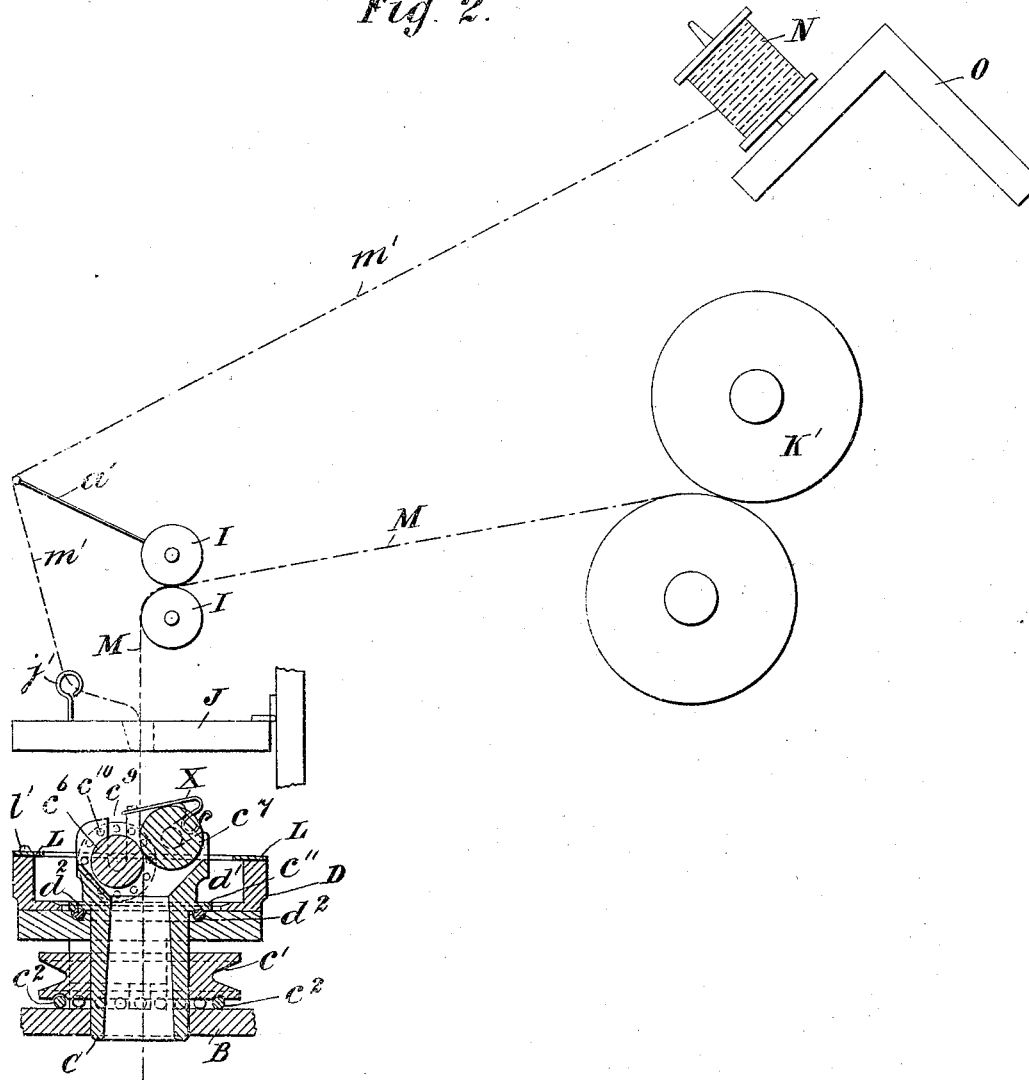
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2 Sheets—Sheet 2.

*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

THEODORE HOLMES, OF PUDSEY, AND JOSEPH KITCHIN AND SAMUEL HARGREAVES, OF LEEDS, ENGLAND.

MACHINERY FOR SPINNING, DRAWING, DOUBLING, AND TWISTING TEXTILE YARNS.

SPECIFICATION forming part of Letters Patent No. 647,138, dated April 10, 1900.

Application filed December 28, 1898. Serial No. 700,526. (No model.)

*To all whom it may concern:*

Be it known that we, THEODORE HOLMES, a resident of Pudsey, near Leeds, and JOSEPH KITCHIN and SAMUEL HARGREAVES, residents of Leeds, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Machinery for Spinning, Drawing, Doubling, and Twisting Textile Yarns and Threads, (for which we have applied for a patent in Great Britain, No. 23,760, bearing date November 10, 1898,) of which the following is a specification.

The object of this invention is to produce an improved mechanism by which the spinning, drawing, doubling, and twisting of textile yarns and threads can be carried out by a continuous motion at one and the same time.

Referring to the drawings which form a part of this specification, Figure 1 is an end elevation in section of a spinning-frame with invention applied. Fig. 2 is an end elevation with the head and parts connected therewith in section. Fig. 3 is a plan of upper side of the drawing-rollers. Fig. 4 is an end elevation of our invention. Fig. 5 is a face view of the pin-wheel.

In carrying out our object the framework A of the machine is similar to that in general use. Upon the framework A, over where the spindles are placed, a horizontal bar B is fixed the full length of the machine. In this bar B a series of holes are made that correspond in number to the spindles in the machine, these holes being directly over the spindles. In each of these holes one end of a tube C is placed, and upon this tube C a grooved driving-wheel  $c'$  is fixed. Between the bar B and the wheel  $c'$  a number of balls  $c^2$  are placed in a circular groove in the bar B around the tube C, and when the tube C and the wheel  $c'$  are in motion the latter runs freely around upon the balls  $c^2$ , and thus reduces the friction and the power required to drive the tube C and wheel  $c'$ . Above the wheel  $c'$  a casting D is put upon and forms a bearing for the tube C, this casting D being fixed to the bar B. The upper end of the tube C is bifurcated, as shown at Figs. 3 and 4, in order to form a

head for receiving two drawing-rollers  $c^6 c^7$ , which are mounted in bearings formed in the said bifurcated head. From the drawings at Fig. 2 it will be seen that the tube C and its bifurcated head are formed in one piece, and a collar or flange  $c^{11}$  is provided on the tube C below its bifurcated head for the purposes hereinafter described, the spindle ends of these rollers being kept in position by springs X, Fig. 3. The casting D at its upper part is made in the form of a box  $d'$ , Fig. 2, and around the upper edge of this box  $d'$  a spiral spring L is adjustably fixed by screws  $l' l^2 l^3$ . This spring hangs over the inside of the box  $d'$ .

Upon the end of the spindle of the roller  $c^6$  a pin-wheel  $c^9$  is fixed by a key. The pins  $c^{10}$  upon the wheel  $c^9$  are fixed around the outer face of the wheel. Around the tube C under the rollers  $c^6 c^7$  a collar  $c^{11}$  is fixed, and in a circular groove in the bottom of the box  $d'$  and around the tube C are a number of balls  $d^2$ , upon which the collar  $c^{11}$  bears. The collar  $c^{11}$  when the tube C is in motion runs freely around upon the balls  $d^2$  with slight friction.

A horizontal shaft E is fixed the full length of the machine. Upon this shaft E a number of grooved wheels  $e'$ , that correspond to the number of wheels  $c'$ , are fixed. The wheels  $c'$  and the wheels  $e'$  are connected by endless bands G. The shaft E is driven from the same shaft that gives motion to the spindles. The wheels  $c'$  are driven by the bands G, as described, giving the twist to the thread, and at the same time a continuous draw is being given to the thread by the action of the pin-wheel by one pin on the wheel traveling under the spring L, being caught at each revolution at the lower end of the spring at  $l^4$ , and traveling over the spring to  $l^5$  the next pin is caught at  $l^4$ , this motion continuing as long as the machine is in operation.

Any required draw can be given to the thread by changing the pin-wheel to a coarser or finer pitch and at the same time raising or depressing the spring L by the screws  $l' l^2$  to regulate it to the pitch of the pin-wheel being used, and any required twist can be given to the thread by increasing or decreasing the speed of the driving-wheel  $c'$ .

Above the upper end of the tube C a flat cap J is fixed by hinges to the frame of the machine, and through this cap J a hole is made which comes directly over the two drawing-rollers  $c^6 c^7$ . On the upper surface of the cap J a wire eyelet  $j'$  is fixed.

The ordinary condenser or roving-bobbins and tin rollers and spindles are used in the machine. The feed and guide rollers are also of the ordinary kind, but they are placed in such a position that when a thread is brought from the condenser or roving-bobbin between them it comes vertically down to the hole in the cap J.

The working of this invention is as follows: A sliver or roving thread M is carried from the condenser or roving-bobbin K' between the feed and guide rollers I through the hole in the cap J, then between the drawing-rollers  $c^6 c^7$ , and through the tube C to the spindle P, the portion of thread between the feed and guide rollers and the drawing-rollers receives a requisite amount of twist during the spinning operation, and in addition a draw is given to it by the two drawing-rollers  $c^6 c^7$  at the same time the ordinary spinning of the thread is being carried on on that portion between the tube C and the spindle P.

In the operation of combined spinning, drawing, doubling, and twisting threads the ordinary creel O is used for the bobbins or cops N, and the wire guards  $a'$  at the front of the machine can be utilized. The additional thread or threads  $m'$  to be used in the doubling and twisting are brought from the bobbins or cops N on the creel O over a guide-wire  $a'$ , that is above the rollers I. They are then carried down to the wire eyelet-hole  $j'$  on the cap J and join the sliver or roving thread M from the condenser or roving-bobbin, the whole being carried through the hole in the top of the cap J and thence between the drawing-rollers  $c^6 c^7$ , when the operation of twisting the threads together is commenced.

Having now described the nature of our

said invention, what we claim, and desire to secure by Letters Patent, is—

1. In machines for spinning, drawing, doubling and twisting textile yarns and threads, the combination of the drawing-rollers, the rotary carrier for the rollers the pin-wheel  $c^9$  connected with one of the same and means for turning the pin-wheel consisting of the spiral spring L, a support therefor and screws for adjusting the spring on the support, substantially as described.

2. In machines for spinning, drawing, doubling and twisting textile yarns and threads; the combination, of the drawing-rollers, the rotary carrier for the rollers the pin-wheel  $c^9$  connected with one of the same and means for turning the pin-wheel consisting of the spiral spring L, a support therefor and screws for adjusting the spring on the support, said support comprising a casting D having its upper part in the form of a box  $d'$ , substantially as described.

3. In combination, the frame A, the bar B thereon provided with holes, the tubes C in said holes, the casting D on the bar B, having its upper part  $d'$  in the form of a box, the drawing-rollers journaled in the heads of the tube C, the driving-pulley  $c'$  mounted upon the tube C below the base-plate of the casting D, means for rotating the pulley  $c'$ , a cap J hinged to the frame A above the drawing-rollers and provided with a central hole through which the thread or yarn passes to the drawing-rollers and means for rotating the drawing-rollers, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

THEODORE HOLMES.  
JOSEPH KITCHIN.  
SAMUEL HARGREAVES.

Witnesses:

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