(No Model.)

M. CHAPON.

SPINNING MACHINE.

No. 378,288. Patented Feb. 21, 1888.

FIG. 3.

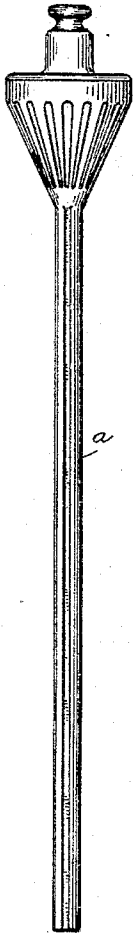


FIG. 1

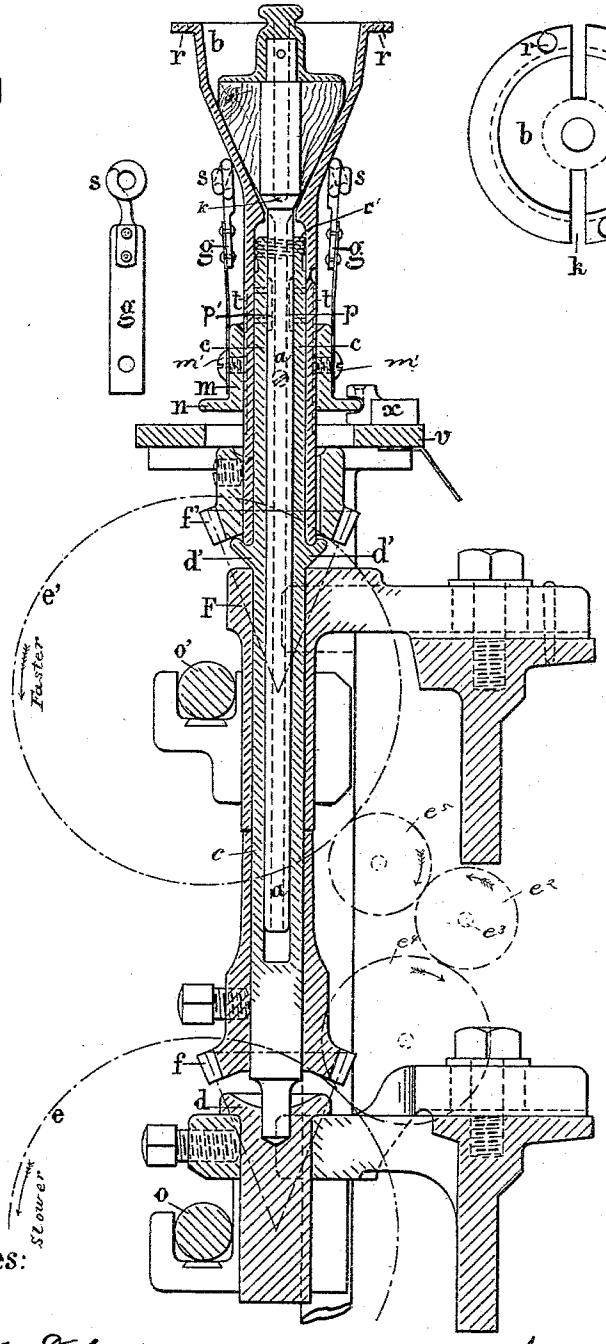


FIG. 2

Witnesses:

Georges Freydier Dubreuil.

Xavier Janicot.

Inventor.

Maximin Chapon.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

MAXIMIN CHAPON, OF COURS, RHÔNE, FRANCE.

SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 378,288, dated February 21, 1888.

Application filed December 13, 1886. Serial No. 221,396. (No model.) Patented in France July 25, 1884, No. 163,516; in England August 5, 1884, No. 10,962; in Germany January 17, 1885, No. 32,813, and in Belgium July 30, 1885, No. 69,771.

To all whom it may concern:

Be it known that I, MAXIMIN CHAPON, a citizen of the French Republic, and residing at Cours, Rhône, France, have invented certain Improvements in Spinning-Machines, (for which invention I have obtained patents in France, dated July 25, 1884, No. 163,516; in England, dated August 5, 1884, No. 10,962; in Germany, dated January 17, 1885, No. 32,813, and in Belgium, dated July 30, 1885, No. 69,771,) of which the following is a specification, reference being had to the accompanying drawings.

This new spindle, which will hereinafter be described, enables thread of large size to be obtained directly by its employment before the carding or any other spinning-machine, the said thread being by the same operation put in cops, and can be employed directly upon the loom on leaving the spindle.

The sheet of drawings accompanying the specification represents, in Figure 1, a vertical section through the axis of this spindle, the spindle proper being shown in elevation; in Fig. 2, a plan view of the part *b*, called a "cone" or "trumpet," which will hereinafter be described; and in Fig. 3 a side elevation of the cone of the spindle.

The detached part which is represented on the left side of Fig. 1 is a front view of one of the thread-guides *g*, represented in side view in Fig. 1.

This spindle is composed of the following principal parts:

First. Of the interior cylindrical spindle proper, *a*, upon which the material, when spun, is wound. This spindle is provided upon the whole of its length with two opposite channels, the object of which will hereinafter be set forth. It carries at its upper part a conical wooden head, over which is arranged a cap, upon the periphery of which head are channels formed according to the direction of generatrices.

Second. Of the hollow spindle *c*, in which the above-named spindle *a* is located. This spindle *c* carries two interior stops, *p p'*, which are located in the channels of the spindle *a*, and which have for their object to cause the simultaneous rotation of these two spindles *a* and *c*, while permitting the spindle *a* to rise freely by sliding with the channels along the said stops. This spindle *c* is provided with a screw-thread, *c'*, at its upper part, which prevents the lubricating-oil from rising, and thus obviates the staining of the spun material. It is pivoted in the bearing *d* and turns in the fixed sleeve on collar F, secured to the frame of the machine. Finally, this spindle carries upon a certain portion of its length a collar or circular ear, *d'*, the utility of which will be demonstrated in the following paragraph:

Third. Of the trumpet *b*, within which the winding is effected and the shape of the cop given. It turns freely in the direction of the two spindles *a* and *c*, and is carried by the collar *d'* of the spindle *c*. In the sides of this trumpet are provided two longitudinal openings, *k*, Fig. 2, serving for the passage of the thread. It may lastly be stated that upon the barrel of this cone or trumpet are formed two channels, *t t*. A sleeve, *m*, upon which the thread-guides *g g* are fixed, carries two screws, *m'*, securing said guides and constituting internal stops, which extend into the said channels *t t* and permit this sleeve to rise freely, as will hereinafter be shown, although they cause it to take part in the rotary motion of the trumpet.

To distribute the thread by the guides *g g* in a uniform manner upon the spindle *a*, recourse is had to a continuous upward and downward motion imparted to a carriage, *v*, extending over the entire length of the machine. Upon this carriage is fixed a small piece, *x*, with which the flange *n* or rim of the sleeve *m* engages. By reason of the engagement of this flange *n* with the part *x*, the sleeve *m* and consequently the thread-guides *g g* are compelled take part in the upward and downward motion of the carriage while rotating with the trumpet *b*.

The operation of the spindles *a* and *c* and of the trumpet *b* described is here effected in the following manner: The spindle *c* is actuated by a wheel, *f*, gearing with another wheel, *e*. The cone or trumpet *b* is actuated by a wheel, *f'*, gearing with another wheel, *e'*.

The axes of these wheels not being in the same plane, skew gear-wheels are employed for this purpose. The wheels *e* and *e'* are keyed upon shafts *o* and *o'*, extending over the whole length of the machine and serving to actuate all the spindles of this machine. Change-pinions placed at the head of the machine drive the shafts *o* and *o'* at different velocities, and enable desirable changes of velocity to be obtained, which it is in one's power to vary according to the degree of torsion to be given to the thread, though, for the sake of convenience of illustration, I have here shown the wheels *e* and *e'* driven by a single gear, e^2, mounted on a shaft, e^3, which gear transmits power to said wheels *e* and *e'* by interposed idle-gears e^4 and e^5, one of which is larger than the other, all as shown in dotted lines in Fig. 1.

The operation of the spindles above described is that which is not generally employed in ordinary bobbin-frames for spinning, the shafts *o* and *o'* operating all the spindles at once. It is well understood that this operation can be effected by other means—such as cords or belts—with a separate engaging and disengaging device for each spindle, and according to the kind of machine for which this spindle is employed, and also according to the applications that can be made of this spindle.

The operation of this spindle takes place in the following manner: The thread coming from the rollers above the spindle, the extremity of the thread is passed downward through one of the two holes *r* provided in the flange of the trumpet. Thence it is passed through the eye *s* of one of the thread-guides *g g*. Then, lifting the spindle *a*, it is introduced through one of two longitudinal openings, *k*, in the side of the trumpet *b*. The spindle is then let down again. The wooden head of this spindle, upon which channels are formed, bears by its own weight upon this extremity of thread and presses it strongly enough against the interior of the trumpet to grasp it, in order that it may partake of the motion of these parts when started. The shafts *o* and *o'* are then set in motion, and the revolution of the parts twists the sliver as it is fed to the rotating spindle from the rollers above. By reason of the difference in the velocity between the spindles *c* and *a* and the trumpet *b*, the winding of the thread upon the spindle *a* is caused, since the trumpet carrying the thread-guides revolves around the spindle *a*. In proportion as this winding is effected the spindle *a* rises gradually as the guides *g* feed the thread in layers upon the cone, and thus continually build an artificial cone of thread farther down upon the spindle *a*, and when the latter is deemed sufficiently provided with thread the thread is cut, the spindle *a* removed from the machine, and the cotton which is wound thereon, forming a cop, may be taken off at pleasure. To form a new cop the spindle *a* is put back in its place, and the end of the cotton which has been cut is grasped in the same manner as above explained.

The friction of this spinning spindle and cop is exceedingly gentle, for, the spindles *c* and *a* and the trumpet *b* turning in the same direction, these parts mutually help each other and render the whole of the spindle light.

In conclusion, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the spindle *a*, the trumpet *b*, means for rotating spindle *a*, and means for rotating trumpet *b* in the same direction as spindle *a* at a different velocity, substantially as described.

2. The combination of the spindle *a*, having an inverted-cone-shaped head provided with exterior longitudinal grooves, the trumpet *b*, provided with longitudinal openings *k* in its sides, within which trumpet said cone fits, and means for rotating said spindle and trumpet in the same direction, but at different velocities, substantially as described.

3. The combination of the spindle *a*, provided with an inverted-cone-shaped head, the trumpet *b*, within which said cone fits, and means for rotating the cone *b* and spindle *a* in the same direction, but at different velocities.

4. The combination of the hollow spindle *c*, having interior stops, *p p'*, the spindle *a* within said hollow spindle *c*, said spindle *a* having exterior longitudinal grooves engaging said stops, and being also provided with an inverted-cone-shaped head, the trumpet *b*, within which said cone fits, and means for rotating the cone *b* and spindle *c* in the same direction, but at different velocities.

5. The combination of the hollow spindle *c*, having interior stops, *p p'*, the spindle *a* within said hollow spindle *c*, said spindle *a* having exterior longitudinal grooves engaging said stops, and being also provided with an inverted-cone-shaped head, the trumpet *b*, within which said cone fits, the barrel of said trumpet being provided with exterior longitudinal slots, *t*, the sleeve *m*, surrounding said hollow spindle *c* and carrying thread-guides *s*, the screws *m'* on said sleeve extending into said slots *t*, and means for rotating the cone *b* and spindle *c* in the same direction, but at different velocities.

6. The combination of the hollow spindle *c*, having interior stops, *p p'*, the spindle *a* within said hollow spindle *c*, said spindle *a* having exterior longitudinal grooves engaging said stops, and being also provided with an inverted-cone-shaped head, the trumpet *b*, within which said cone fits, the barrel of said trumpet being provided with exterior longitudinal slots, *t*, the sleeve *m*, surrounding said hollow spindle *c* and carrying thread-guides *s*, the screws *m'* on said sleeve extending into said slots *t*, the piece *x*, engaging said sleeve, means for imparting an upward and downward motion to said piece *x* and through it to the sleeve *m*, and means for rotating the cone *b* and spin-

dle *c* in the same direction, but at different velocities.

7. The combination of the hollow spindle *c*, the exterior circular collar, *d'*, thereon, trumpet *b*, supported by said collar, interior spindle, *a*, having a head fitting within said trumpet, and means for rotating said spindle *c* and trumpet *b* in the same direction at different velocities, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MAXIMIN CHAPON.

Witnesses:
GEORGES FREYDIER DUBREUL,
XAVIER JANICOT.