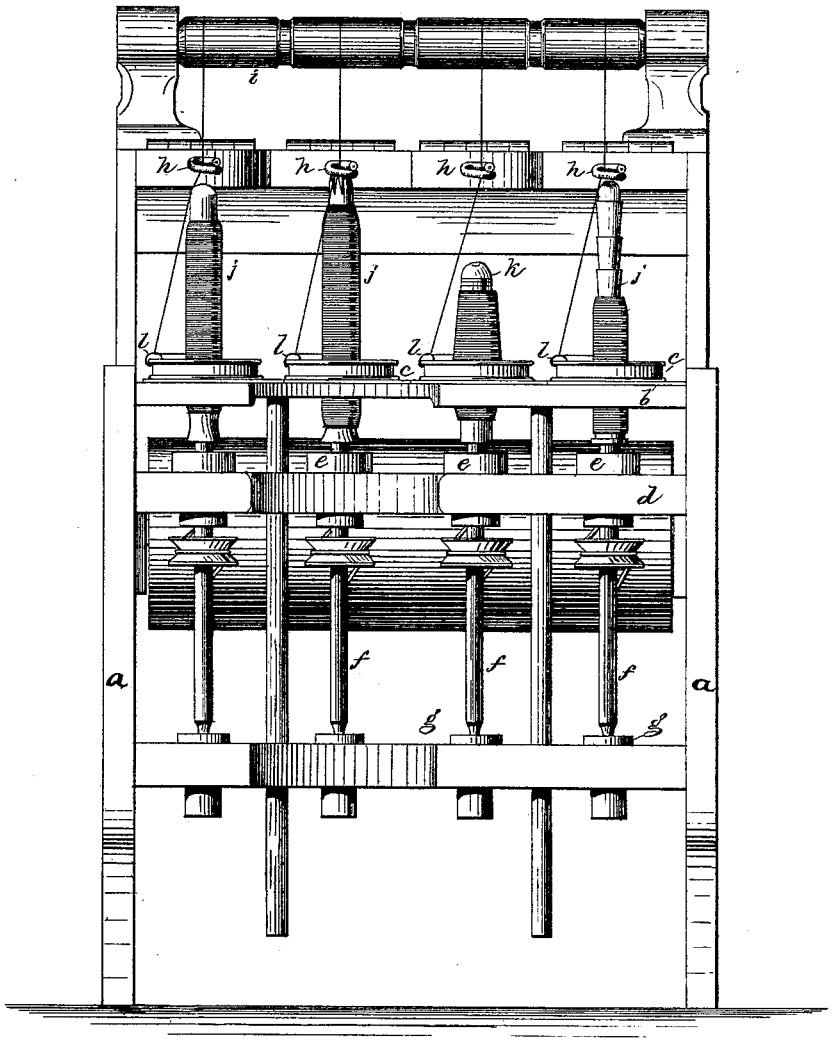
2 Sheets—Sheet 1.

W. F. DRAPER.

RING SPINNING-FRAMES.

No. 190,710. Patented May 15, 1877.

Fig. 1.



Witnesses.
L. H. Latimer.
W. J. Pratt.

Inventor.
William F. Draper.
per Crosby & Gregory Attys

2 Sheets—Sheet 2.

W. F. DRAPER.

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Fig. 5.

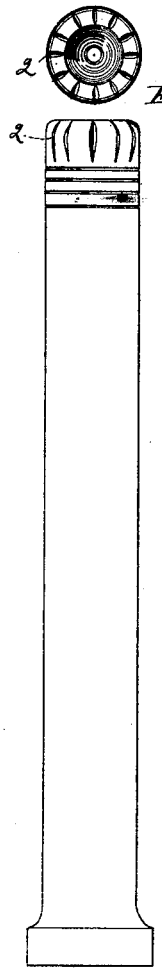


Fig. 2.

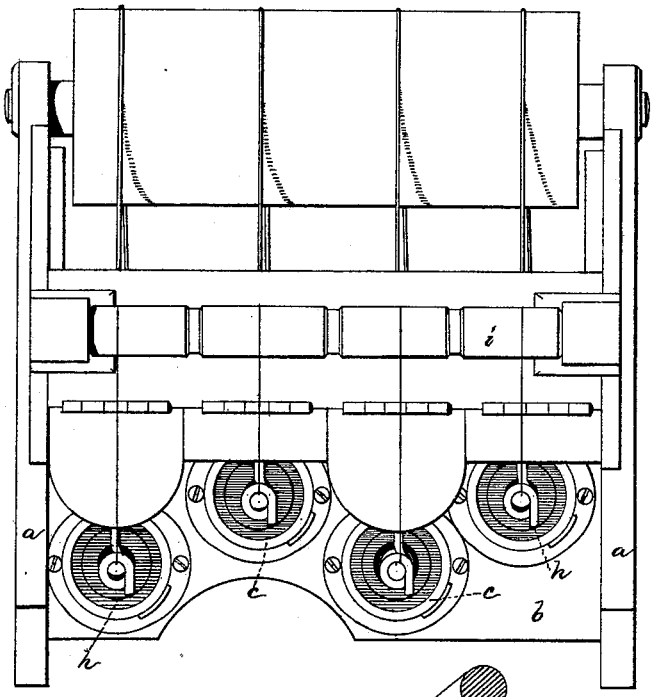


Fig. 4.

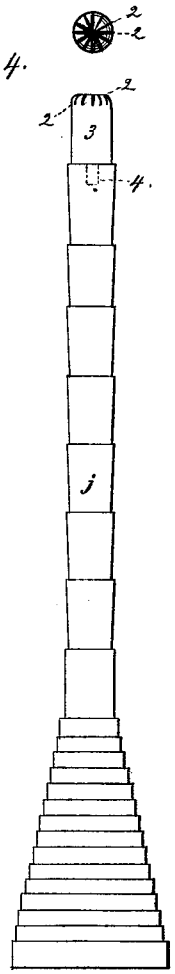


Fig. 3.

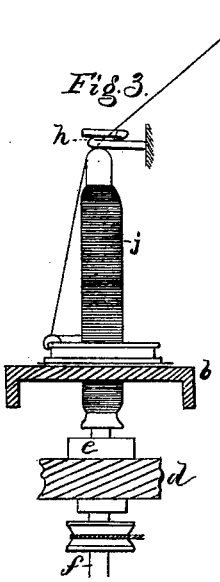
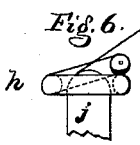


Fig. 6.



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Attys.

UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS.

IMPROVEMENT IN RING-SPINNING FRAMES.

Specification forming part of Letters Patent No. **190,710**, dated May 15, 1877; application filed September 22, 1876.

To all whom it may concern:

Be it known that I, WILLIAM F. DRAPER, of Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in the Art or Method of Spinning on Ring-Spinning Frames, of which the following is a specification:

This invention relates to improvements in ring-spinning frames.

In ring-spinning frames as now ordinarily constructed the guide-wires occupy a position about two inches above the upper end of the bobbins, and the threads extending from the guide-wires to the travelers are thrown outward by centrifugal action, and move in an arc about the upper ends of, but do not touch, the bobbins.

In such spinning-frames the twist is put into the yarn between the travelers and guide-wires, and passes from the guide-wires to the rolls; but the pressure of the yarn upon the guide-wires is sufficient to obstruct the passage of the twist past the guide-wires to the rolls, thereby materially lessening the amount of twist in, and making the yarn weaker, between the guide-wires and rolls.

In practice, the principal amount of breakage of yarn occurs between the guide-wires and rolls, where it has less twist, and is consequently less strong than between the spindles and guide-wires.

I have discovered, by experiment, that the nearer the twisting-point to the bite of the rolls, the more even and uniform the twist at the latter point, and the less the liability of the yarn to break in spinning. The yarn should be as strong between the guide-wires and rolls as between the spindles and guide-wires, and to effect this the amount of twist which the spindle will put into the yarn should be equally distributed into the yarn above the guide-wire.

The object of this invention is to prevent the yarn breaking when being spun, and to make the twist more uniform, and this I accomplish by bringing the twisting-point nearer the rolls than heretofore, and twisting the yarn between the top of the bobbins and the rolls, instead of, as heretofore, from the traveler to the rolls. By increasing in this way the twist in, and making the yarn stronger between the guide-wires and rolls, I am enabled to use on any given-sized yarn a heavier traveler than usual when I desire to wind the yarn harder, and, by extending the twist evenly to the bite of the rolls and using a very light traveler, I am enabled to spin yarn with less twist than is possible on a frame wherein the amount of twist in the yarn is greatest between the bobbins and guide-wires.

Figure 1 represents, in front elevation, part of a ring-spinning frame provided with my improvements. Fig. 2 is a top view; Fig. 3, a partial sectional view; Figs. 4 and 5, two forms of bobbins; and Fig. 6, a view of a bobbin extended upward into a guide-wire.

The frame *a* of the machine, ring-rail *b*, rings *c*, bolster-rail *d*, bolsters *e*, spindles *f*, foot-steps *g*, and guide-wires *h* and front rolls *i*, are or may be of any ordinary or usual construction, and may be operated in any usual way.

In Fig. 1 I represent three bobbins, adapted to operate in accordance with my invention; but the bobbin *k* is set with relation to the guide-wires *h*, as now common to spinning-frames, in order to more clearly illustrate my invention.

In my invention the upper ends of the bobbins *j* are placed nearer the guide-wires than heretofore, and in doing this I preferably elongate the bobbin at top, permitting the bottom of the bobbin to remain in its usual position, as I am thereby enabled to increase its capacity for receiving yarn, which is of great importance both in spinning and weaving, specially when the yarns are spun upon filling-bobbins.

The upper ends of the bobbins, as shown in Figs. 1, 3, and 6, extend up almost to, or just within, the guide-wires *h*, so that the yarns extending from the guide-wires to the travelers *l* constantly bear against the upper ends of the bobbins, and consequently the upper ends of the bobbins become the twisting-points, and the yarn is twisted between the upper ends of the bobbins and the bite of the rolls, an upper roller resting upon roller *i*, as usual. In this way it will be readily seen that the twist imparted to the yarn from the twisting-point or upper end of the rotating bobbin will

easily pass over the guide-wire, for the angle of the yarn at, and its pressure upon, the guide-wire is materially lessened.

When the upper end of the bobbin projects upward toward the guide-wire far enough to bear against the yarn during the revolution of the bobbin, the length of the yarn between the bobbin end and the guide-wire is very short, and the twist is easily crowded past the guide-wire, upon which the yarn bears but lightly.

In carrying out this invention I propose in most instances to extend the upper end of the bobbin to such a height with reference to the guide-wires that the yarn extending from such upper end to the usual front rollers shall once during each rotation of the bobbin extend from the bobbin point or end to the bite of the rolls in substantially a straight line, or, in other words, the bobbin-point will be raised high enough to practically relieve the yarn from pressure against the guide-wire, thereby permitting the twist to run uniformly from the bobbin-point or upper end to the bite of the rolls.

The upper ends of the bobbins may be smooth, as shown by the bobbins at the extreme right and left of Fig. 1; but instead of such bobbins with smooth ends I prefer to notch or roughen the upper end of the bobbin, as shown in Figs. 1 and 4, the notches 2 serving to engage and retain the yarn at the upper end of the bobbin and cause it to revolve therewith. These notches act to make the twist more positive, the yarn slipping from one to the other notch when the yarn is wound upon the bobbin.

Fig. 4 shows a bobbin such as I prefer to use for filling, the yarn being wound thereon with the filling-wind, and preferably in a machine having a capacity of varying the relative speeds of the spindles and rollers with reference to each other during the time that the bobbins are being filled.

The upper end of this bobbin is shown as extended by means of a top piece, 3, of boxwood, bone, vegetable ivory, celluloid, metal, or other equivalent smooth and hard material, provided with a projecting piece, 4, or equivalent, to fit the upper end of the usual bobbin. The length of this top piece may be more or less, according to the length of the bobbin; but instead of making this top piece separate, the barrel of the bobbin, when new bobbins are made, may be made larger, and the upper or smallest end of the bobbin may then be notched or roughened, or may be left smooth, if desired, or may be provided with a metallic notched cap.

In Fig. 5 I show a different form of bobbin, with its end extended and notched to engage and carry the thread around with it. It is expressly understood that the barrel and the base of the bobbin can be of any usual configuration.

A spinning-frame provided with bobbins extended and operating as before described may be made to put in the yarn or sliver so little twist that the machine is rendered capable of producing roving, as in a fly-frame.

In practice I have twisted number thirteen yarn with but six and three-quarters turns to the inch, and the roving so produced was subsequently respun on the same frame, producing number sixty yarn.

In this my invention I force contact between the top of the bobbin and the yarn being spun, and finished yarn extends from the top of the bobbin to the traveler, instead of from the traveler to the barrel of the bobbin, as heretofore usual.

When the bobbin (see Fig. 4) is placed in a shuttle, the notches 2 act to prevent the thread from kinking when being reeled off.

Instead of placing the spindles in a single row, as usual, I have arranged them as shown in Fig. 2.

I claim—

1. The combination, with the traveler, guide-wire, and front roller, of a bobbin extended up to or near the guide-wire, and adapted to bear against the yarn being spun or twisted, and to force the twist from the end of the bobbin to the front roll, substantially as described.

2. A bobbin notched or roughened at its upper end to engage the yarn, substantially as described.

3. The combination, with the bobbin, of a removable top piece or extension, substantially as described.

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

WM. F. DRAPER.

Witnesses:
F. J. DUTCHER,
E. D. BANCROFT.