W. F. DRAPER.

SPINNING-FRAME.

Patented April 24, 1877.

No. 189,890.

189,890. SPINNING-FRAMES. W. F. Draper, Hopedale, Mass. [Filed Oct. 2, 1876.]

Brief.—A bobbin provided with a bearing at the upper end is, at its lower end, engaged by a whirl. The journal at its upper end, or the bearing-surface therefor, is grooved, so as to form bearing-surfaces and spaces alternately.

1. A whirl, and a bobbin adapted to be moved by the whirl, in combination with a top piece and a guide-surface therefor, the top piece and guide-surface being constructed with projecting bearing-points and intervening spaces for the yarn, to steady the bobbin and to permit the yarn to slip from one to the other space when the yarn is being wound upon the bobbin, substantially as described.

2. In combination, a bobbin and a top piece, and a guide surface or wall constructed to afford projecting bearing-surfaces and spaces at intervals, as described, and having a slot leading to such spaces, substantially as described.

Fig. 1.

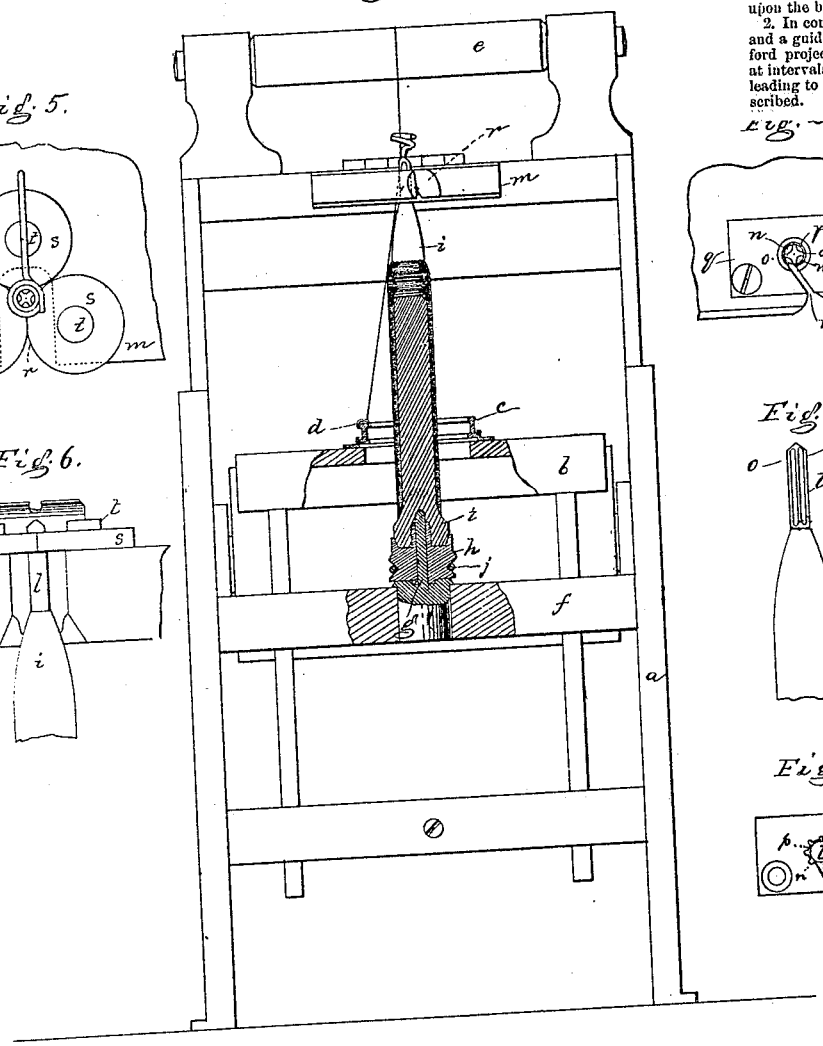


Fig. 5.

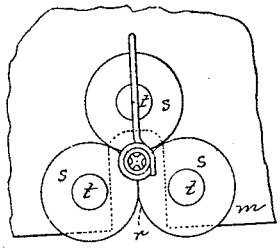


Fig. 2.

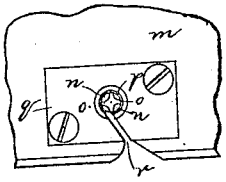


Fig. 6.

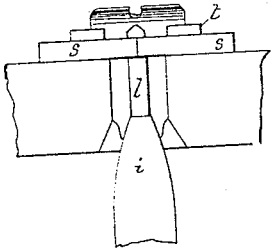


Fig. 3

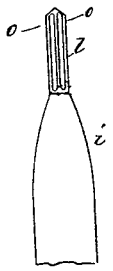


Fig. 7.

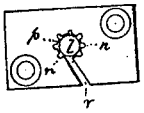
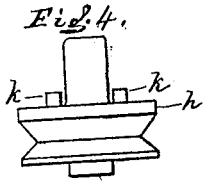


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS.

IMPROVEMENT IN SPINNING-FRAMES.

Specification forming part of Letters Patent No. **189,890**, dated April 24, 1877; application filed October 2, 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 Improved Spinning-Frame, of which the following is a specification:

In ring spinning-frames as now commonly constructed, the bobbin is carried by a long spindle, to which it is caused to adhere by friction. In the most approved form of such frames the spindle is sustained within the bobbin or yarn-load by a long bearing, as in the well-known Sawyer plan, the bolster steadying the spindle near its upper end.

In another form of spinning-frame, a whirl made to revolve upon a stud has been adapted to engage the base of the bobbin, the upper end of which was restricted as to its movements, through a cylindrical pin or top piece projecting from the upper end of the bobbin into a cylindrical opening in a guide-board, a spindle to extend through the bobbin being dispensed with. I do not claim the devices just enumerated either separately or combined.

This my present invention, has reference to a spinning-frame having a bobbin of this latter class and moved by a whirl, and the invention consists in such a construction of this top-steadying pin, or the guide for it, or both, that will afford spaces between the contact points of the steadying pin and guide to permit the twisted or spun thread to slip about the point of the pin which forms the lip of the bobbin as the thread is wound upon the bobbin.

In the plan referred to, and upon which this invention is considered an improvement, the top piece at the upper end of the bobbin is round, or like the point of an ordinary spindle, and the guide-opening to receive it, also round, is enough larger than the top piece to permit the free passage of the yarn about the top piece, and consequently the upper end of the bobbin is not effectually steadied.

In this my improved plan, opposed portions of the top piece are at all times in contact with portions of the guide-surface, or faces surrounding the top piece, such guide-surface bounding the opening in which the top-piece revolves and by which it is held steady during the rapid rotations of the bobbin and its whirl.

Figure 1 represents in front view, and partially in section, sufficient of a spinning-frame to illustrate my improvement. Fig. 2 is a top view of the guide-surface for the top piece; Fig. 3, a view of the top of the bobbin with the top piece attached; Fig. 4, a modified form of whirl; Figs. 5 and 6, modified forms of the guide-surface or wall; and Fig. 7, a further modification.

The frame *a* of the machine is provided with a lifting ring-rail, *b*, ring *c*, traveler *d*, and drawing-rollers *e*, of any ordinary construction, and they may be operated in any ordinary way. The rail *f* is provided with a whirl-holding stud, *g*, one for each whirl *h*, and bobbin *i*, the whirl being revolved upon such stud by a band, *j*. The bobbin, as represented in Fig. 1, is placed within the socketed upper portion of the whirl, the friction between the whirl and bobbin being sufficient to move the bobbin with the whirl as the latter is revolved. Instead of the whirl shown in Fig. 1, I may employ any other suitable form of whirl, as in Fig. 4, where the pins *k* engage the lower end of the bobbin in the usual manner.

At the upper end of the bobbin is placed a top piece, *l*, adapted to extend upward through a guide-opening in a guide-board, *m*. This guide-opening for the top piece *l* and the top piece are so constructed with relation to each other as to present bearing portions and spaces at intervals between the guide-surface or wall and the peripheral surface of the top piece.

Under the construction shown in Figs. 1, 2, 3, the top piece is grooved at *n*, (in this instance at four places, but it may be at two or more places,) leaving four bearing projections, *o o*, adapted to meet the acting-face of the guide-opening *p* at different points. The guide-opening in these figures is shown as made in a block of raw-hide, *q*, attached to the guide-board *m*, the opening being cylindrical. Between the bearing projections and the guide-opening there are four spaces shown in Fig. 2, in which the yarn, being spun and extended from the usual front roller of the drawing-rollers *e* to the traveler, is contained.

The yarn must move about with the upper end of the bobbin, (in this instance it is contained between one of the openings in the top piece and the guiding-surface therefor,) and to place the yarn in such position I provide a slot or passage, *r*, thereby preventing passing the yarn through an eye, as would be necessary if a slot did not lead laterally into the guide-opening.

The yarn being spun, and contained in one of the spaces between the top piece and guide-surface for the top piece, moves about with the bobbin. Were both the top piece and guide circular, it would be necessary, as before described, to make an annular space large enough for the passage of the yarn without injurious friction, or for the passage of such bunches upon the same as it is wished to have pass through without breaking down the "end," and so made, the guide-opening would not act to effectually steady the top piece, and consequently the bobbin.

By grooving the top piece, as described, the yarn is permitted to extend through one of the grooves, and move about with the bobbin and top piece, when steadied at the top. As the yarn is wound upon the surface of the bobbin, it must slip or change its position with reference to the top piece, or upper end of the bobbin, with which it is in contact. When the groove *m*, holding the yarn, comes opposite a slot, *r*, the yarn, then free, moves or slips from one to another groove, skipping one or more grooves, according to the tension upon the yarn then being wound.

It will be seen that a top piece and guide-surface, constructed as described, affords numerous bearing-points between the moving-surface of the top piece and the guide-opening and the top piece, and, consequently, the bobbin is effectually steadied at its upper end, thereby permitting it to be run very rapidly with less wabbling.

The gist of this invention is the provision of several bearing-points and intermediate spaces between the top piece or upper end of the spindle and the guide-surface or wall about it, whereby the bobbin is effectually steadied through contact of the top piece with the guide-surface at several points, the spaces permitting the yarn to turn with the top piece and bobbin without injurious friction, and as the yarn is wound upon the bobbin it is permitted to slip or change its location or position with relation to the top piece or upper end of the bobbin.

By the use of a rawhide guide piece, *q*, lubrication of the top piece is avoided.

Instead of making the guide-surface circular, with but one slot or opening *r*, as in Figs. 1 and 2, I may form the guide-surface as shown in Figs. 5 and 6, wherein are employed three disks, *s*, pivoted at *t*, the peripheries of the disks bearing against the top piece or upper end extension of the bobbin, forming a guiding-surface or wall, with three bearing points between it and the top piece, and there are spaces at each side of each bearing-point.

In this modification it is not actually necessary to groove or notch the top piece, as shown in Fig. 3, and it may be left plain, for the disks turn with the top piece, and the yarn, contained in one of the spaces between the rollers and top piece, when the bobbin acts to wind the yarn, slips and is moved from one space to the other between rotating surfaces, injurious rubbing friction between the top piece and guide wall or surface being thereby avoided, at the same time that a true bearing-surface for the top piece is preserved. The yarn passing from the front rolls to the spaces above described, passes also through a guide-wire of usual construction.

In Fig. 7 the guide-opening is made in a block, but instead of being circular, it is provided with spaces *n*, for the reception and passage of yarn, the spindle then being preferably plain.

I do not broadly claim a hinged or movable guide-board provided with a bearing for the upper end of the bobbin, nor such a guide-board with a guide-wire.

I claim—

1. A whirl, and a bobbin adapted to be moved by the whirl, in combination with a top piece and a guide-surface therefor, the top piece and guide-surface being constructed with projecting bearing-points and intervening spaces for the yarn, to steady the bobbin and to permit the yarn to slip from one to the other space when the yarn is being wound upon the bobbin, substantially as described.

2. In combination, a bobbin and a top piece, and a guide surface or wall constructed to afford projecting bearing-surfaces and spaces at intervals, as described, and having a slot leading to such spaces, 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:
GEO. W. GREGORY,
W. J. PRATT.