(Model.)

R. WHITE.

RING FOR SPINNING AND TWISTING FRAMES AND TRAVELER THEREFOR.

No. 290,377. Patented Dec. 18, 1883.

Fig: 1.

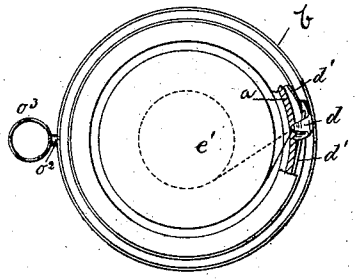


Fig: 2.

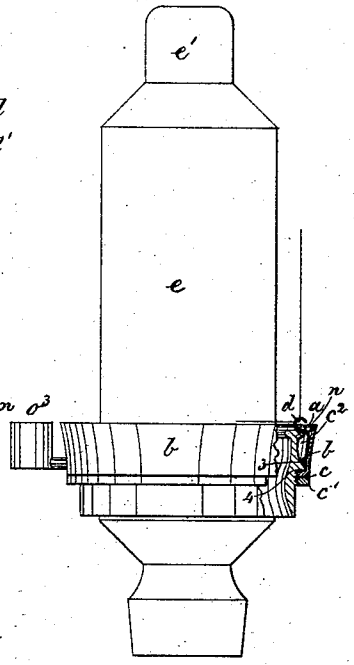


Fig: 3.

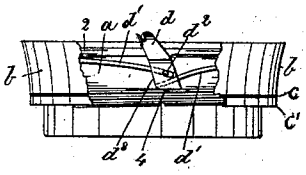


Fig: 4.

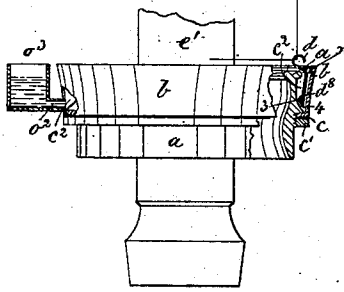


Fig: 5.

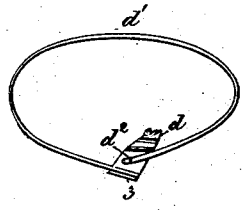


Fig: 6.

Fig: 7.

Fig: 7a.

Fig: 8.

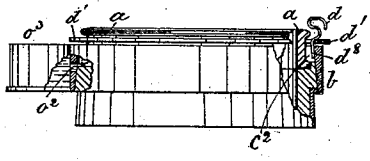


Fig: 9.

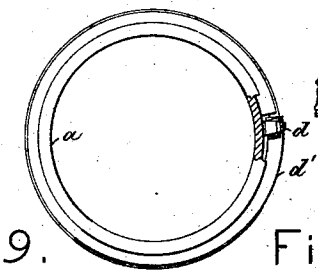


Fig: 10.

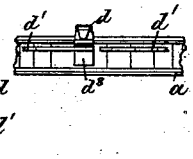
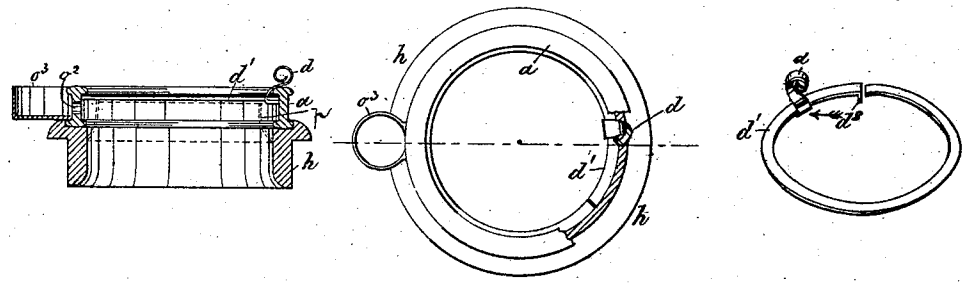
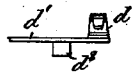


Fig: 11.





Witnesses.

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John F. C. Preuss Lert

Inventor.

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by Emery Gregory Attys.

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

UNITED STATES PATENT OFFICE.

ROLLIN WHITE, OF LOWELL, MASSACHUSETTS.

RING FOR SPINNING AND TWISTING FRAMES AND TRAVELER THEREFOR.

SPECIFICATION forming part of Letters Patent No. 290,377, dated December 18, 1883.

Application filed December 19, 1882. (Model.)

To all whom it may concern:

Be it known that I, ROLLIN WHITE, of Lowell, county of Essex, State of Massachusetts, have invented an Improvement in Rings for Spinning and Twisting Frames and Travelers Therefor, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in ring spinning or twisting frames has for its object to equalize the draft on the yarn as it is being wound upon the bobbin or spool.

In ordinary ring-frames, both for spinning and twisting, the yarn between the guide-eye and bobbin is passed through and draws a traveler about a ring-race, the weight of the traveler so moved and its friction on the race producing more or less tension, according to the friction. When the yarn is being wound upon the part of a conical cop which is of greatest diameter, the tension or pull of the former on the traveler being nearest the line of the direction of movement of the said traveler, requires the least amount of pull to move the latter on the race, and the tension on the yarn is therefore at the minimum; but as the yarn is being wound upon the bare bobbin, or that part of the cop of smallest diameter, the strain thereon to draw the traveler about the race is increased, for the yarn then assumes a direction more at right angles to the path of movement of the traveler, the strain on the yarn increasing in proportion as the latter assumes a direction more radial to the race of the ring, and this increased strain results in a gradual increase of tension, the tension thus increasing as the yarn is laid from the large part of the cop toward the center of the bobbin, and decreasing when laid in the opposite direction.

To equalize the tension on the yarn as it is being wound upon a conical-shaped cop or bobbin, it has been proposed to mount the traveler upon a revolving ring, having its movement accelerated and then retarded, to thus assist and retard the movement of the traveler.

In this my invention I employ an elastic or yielding traveler composed of a spring and a connected hook or eye through which the yarn may pass on its way to the bobbin, cop, or spool. The traveler-spring, or a connected part thereof, in its normal condition, exerts upon the ring, or an annular part or surface co-operating therewith and preferably fixed with relation to the ring, a maximum or certain amount of friction when the yarn is being wound or laid upon that part of the cop which is of greatest diameter, the pull of the thread then being nearest the direction of movement of the traveler, as described; but as the yarn gradually approaches the center line of the bobbin, or where the yarn-receiving surface is of least diameter, the direction of the pull of the yarn on the traveler becoming more and more radial with relation to the ring and bobbin, or more at right angles to the movement of the traveler, the yarn so draws upon the hook of the traveler as to cause the spring-pressed or rubbing frictional portion thereof to gradually exert less and less friction upon the ring or part or surface co-operating therewith, as stated, thus decreasing the normal frictional resistance which is exerted by the traveler in proportion as the yarn occupies a more radial position, when, as stated, the strain on the yarn to move the traveler on the race is an increasing strain. As the yarn is being laid from a small to a larger part of the bobbin or cop, the action is the converse of that stated.

To enable my improved spring-traveler to be moved about the ring without unnecessary friction or hard points, I have provided the ring with an oil-cup or circular chamber, which I have shown as so constructed that the ring and traveler may be oiled when in motion and be kept supplied with oil.

I have shown several different forms of spring-travelers which embody my invention.

My invention consists, chiefly, in a ring for a spinning or twisting machine, combined with a spring-traveler and attached rubbing or frictional portion placed on and adapted to co-operate with the ring, or with a co-operating annular surface forming part of it, to exert a gradually increasing and decreasing amount of friction, according as the yarn is traveling from a small to a larger part of the bobbin or cop, or vice versa.

Figure 1 represents in broken plan or top view a spinning-ring traveler and oiling apparatus embodying my invention, a bobbin be-

ing shown as located therein. Fig. 2 is a partial side elevation and section of the same, with the spring-traveler shown as exerting its maximum friction; Fig. 3, a side elevation of the ring and spring-traveler with the outer annular surface broken away. Fig. 4 is a view similar to Fig. 2, showing the traveler as exerting its minimum friction, there being but a layer or two of yarn on the bobbin; and Fig. 5 represents the spring-traveler detached, the view being in perspective from the rear side of Fig. 3. Fig. 6 is a side view and partial section of a modification. Fig. 7 is a top view of the ring shown in Fig. 6, with the top of the race broken out. Fig. 7ª is a detail showing the contiguous ends of the spring of Fig. 7 and part of ring at one side of the hook, instead of directly below it, as in Figs. 3 and 6. Fig. 8 is a vertical section of a modified form of my invention, the traveler being shown as applied within the ring-race, the ring being an ordinary double-raced ring without a neck and applied to a holder. Fig. 9 is a top view of the ring and traveler of Fig. 8. Fig. 10 shows the traveler removed from the ring; and Fig. 11, a modification to be hereinafter referred to, it showing the frictional surface.

The ring *a*, Figs. 1 to 4, the race of which may be of usual construction, has adjustably applied to it an annular surface, *b*, which surrounds the said ring near the traveler-race. The annular surface *b* has a flange, which is provided with a screw-thread to fit a threaded part of the ring below its shoulder, below which, in turn, is a packing, *c*, and then a check-nut, *c'*, the latter being screwed upon a threaded part of the shank of the ring.

The annular space or chamber c^2 between the ring and surface *b* forms an oil-cup to receive and retain oil to lubricate the traveler-race.

My improved traveler is composed of a spring, *d'*, and an attached hook or eye, *d*, the hook being preferably connected with the spring at or near one end.

In Figs. 1 to 5 the heel end of the spring is provided with a suitable offset or projection to loosely enter and engage a slot in the broad part of the hook, as best shown at d^2, Figs. 3 and 5. The spring *d'* (see Figs. 1 to 5) surrounds the ring-race, and by its shape acts to force the lower part or foot, 3, (see Figs. 2 and 4,) of the hook or frictional part connected to it and moving with the traveler against a fixed or stationary part, 4, of the ring, and also as best shown in Figs. 2 and 3, against the ring-race, and also, as shown in the said figures, the spring forces the outer or frictional face, d^3, of the said hook or part connected and moving with the traveler against the inner side, herein shown as inclined, of the annular surface *b*, which co-operates with the traveler and ring to produce the maximum amount of friction.

In the normal condition of the spring *d'*, (see Fig. 2,) the lower end, 3, and inner rounded side of the hook are borne with greatest force against the flange or part 4 of the body of the ring, and at the same time the upper inner portion of the hook is pressed against the ring-race, and the outer face of the hook is pressed against the annular surface *b* outside of it. While the spring forces the parts referred to together the yarn will occupy the full-line position, Figs. 1 and 2, it being then laid upon the largest diameter of the cop *e* of the bobbin *c'*. As the yarn approaches the bobbin from its full to its dotted line position, Figs. 1 and 4, or gradually assumes a more radial position, it acts to draw the hook and spring toward the center of the bobbin, thus decreasing the friction due to the force of the spring bearing the foot 3, or side face of the moving part *d* against and reducing or removing the pressure of the said foot and part *d* from the ring, and at the same time from the annular surface *b*, if the pull on the yarn is sufficient to require such release, in order that the traveler may be moved with the requisite freedom.

Fig. 4 shows the spring-traveler as drawn upon by a radial and upward pull sufficient to enable the traveler and its attached parts to exert the minimum friction. The annular surface *b*, Figs. 1 to 5, is shown as made tapering, so that as the hook and the spring connected with it are drawn upward the friction exerted thereon will be decreased.

By adjusting the annular surface *b* up or down on the ring, the said surface may be made to co-operate with the spring and the attached friction-surface moving with it to exert greater or less pressure—greater as it is raised by turning it on the screw-thread on the ring, and vice versa.

In the modifications, Figs. 6 and 7, the annular surface *b* is vertical, and a flat part of the hook or eye *d* bears against it, and the spring *d'* is kept in place by the outer flange of the ring-race, so that the spring cannot rise between the ring *a* and annular surface.

I desire it to be understood that the outer flat face or part, d^3, of the hook *d*, attached to and carried by the spring-traveler may be either a permanent part of the hook, as in Figs. 3, 5, 6, or it might be separate from the hook, as at d^3, Fig. 11. All that is needed in this particular is that the surface carried by the spring *d'* be a friction-surface capable of acting upon the ring or annular surface *b*, and this friction-surface may be more or less large, and in some instances the spring of the traveler will, of itself, form the friction-surface—as, for instance, in Figs. 8, 9, and 10.

Viewing Fig. 7ª, it will be seen that the two ends of the spring *d'* are not connected, as in plan, Figs. 1 to 5, and that the difference in the friction to be exerted by the spring depends solely upon the expansion and contraction of the spring, rather than by any other movement of it, and that the friction is exerted chiefly upon the annular surface *b*. The two ends of the spring meeting together, prevent undue tightening of the spring upon the ring. If the yarn moves the spring-traveler in

the direction designated by the arrow, Fig. 10, the friction exerted by it will be greater than if the yarn pull the traveler in the opposite direction, it being assumed that the traveler exerts its friction on a surface, *b*, outside the ring.

In Figs. 1 to 5 the foot or part 3 might be cut away so as not to bear against the part 4 of the ring. In such case the friction would be exerted on the race, and by the flat side or part d^8 of the hook below the upper arm of the spring, it being pressed outward against the surface *b*, substantially as will be described of the modification, Fig. 6.

In the modifications shown in Figs. 8 and 9, the spring-traveler represented separately in Fig. 10 is placed inside the usual ring, *a*, and exerts its pressure outward against the inner side of the said ring, as does the spring-traveler before described against the inner side of the annular surface *b* outside the usual ring.

In Figs. 8 to 10 the outer edge or periphery of the ring *d'* and the hook exert friction against the inner wall of the ring and the race thereof, as may also the part d^8. The ring *a*, Figs. 8 and 9, is held in a holder, *h*.

The rings shown in Figs. 1 to 6 of the drawings have oil wells or reservoirs o^3, which receive oil and permit it to flow through a passage, o^2, as needed into the annular chamber c^2, in which the traveler moves.

In Fig. 8 the oil-well o^3 is located at the outer side of the ring, and a tube, o^2, permits oil to flow against the inner side of the ring, to lubricate the surface against which the spring *d'* or traveler bears.

The oiling contrivance may be variously modified without departing from my invention, and, if desired, or necessary, a flange, *p*, may be erected inside the holder or at the base of the ring, as in dotted lines, Fig. 8, to permit escape of oil below the holder, to thus protect the cop from oil and to retain the oil for lubricating the traveler.

My invention is advantageous in all cases where rings with travelers are employed to wind yarn upon bobbins, cops, or spools.

The spring-traveler may extend more or less about the ring, and the shape of the spring may be varied and different portions of it may be made to project more or less to normally bear against the ring or the stationary surface co-operating with it.

I have made some of the spring-travelers of spring-wire to fit about the ring and its race, and exert friction against the ring and race and the annular surface, or either of them, the shapes of the traveler being such under all conditions that the greater the radial pull the less the friction exerted by the traveler against the stationary surfaces with which it co-operates.

To prevent oil from being thrown over the top, of the annular surface *b*, placed about the ring, and out from the oil-well, I have provided the surface *b* with a flange, *n*. (See Figs. 2 and 4.)

I claim—

1. A spring-traveler provided with a hook or eye for the yarn, combined with a ring, the said spring-traveler, or a part attached thereto and moving with it, being adapted, substantially as described, to be operated by the variable tension of the yarn to exert a varying friction, against the ring, to counteract the effects of the variable tension produced by the different diameters in the bobbin or cop and yarn laid thereon, as set forth.

2. A spring-traveler provided with a hook or eye for the yarn, combined with the ring and a co-operating annular surface, against which a part fixed to or moving with the traveler is borne, as described, whereby the friction or resistance to the movement of the traveler about the race is made variable, in accordance with the angle of the yarn being wound upon parts of the bobbin, cop, or spool of different diameters, substantially as described.

3. A traveler combined with a ring and an annular surface forming a groove in which said traveler moves, and an oil-cup opening into said groove, substantially as and for the purpose described.

4. The ring and the spring-traveler adapted to exert more or less friction upon the parts around which it is drawn by the yarn, in accordance with the varying diameter of the bobbin, cop, or yarn load, combined with an annular or bearing surface, co-operating with the said ring and traveler, and made adjustable with relation to the ring, substantially as described.

5. The spinning-ring and traveler, combined with the co-operating annular surface provided with a flange to prevent the escape of oil over the top of the said surface, substantially as described.

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

ROLLIN WHITE.

Witnesses:
G. W. GREGORY,
BERNICE J. NOYES.