No. 705,153. Patented July 22, 1902.

S. SMITH.

DRAG DEVICE FOR BOBBINS OF DRAWING AND SPINNING FRAMES.

(Application filed Aug. 25, 1899.)

(No Model.)

Fig. 1.

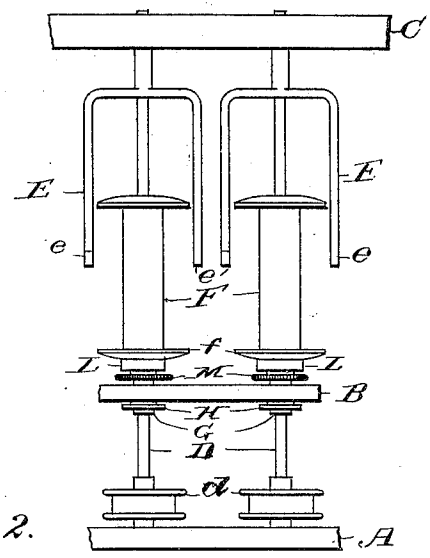


Fig. 2.

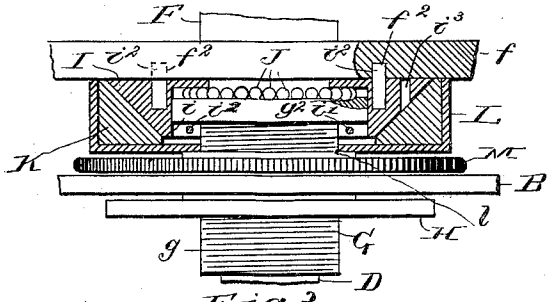


Fig. 3.

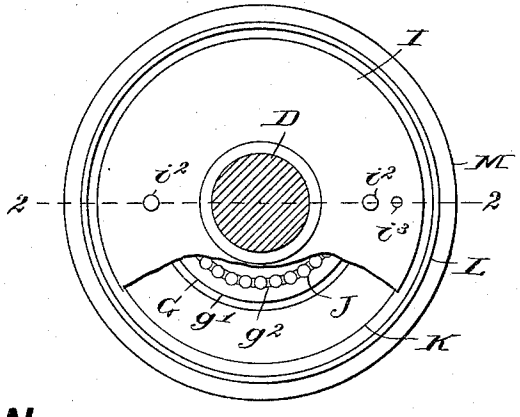
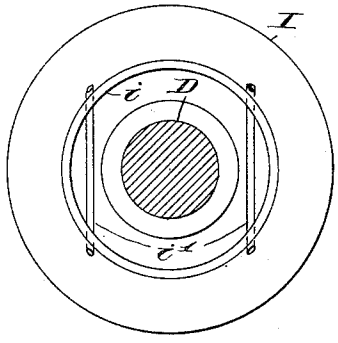


Fig. 4.



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DRAG DEVICE FOR BOBBINS OF DRAWING AND SPINNING FRAMES.

SPECIFICATION forming part of Letters Patent No. 705,153, dated July 22, 1902.

Application filed August 25, 1899. Serial No. 728,400. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SMITH, a citizen of the United States, and a resident of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Drag Devices for Bobbins of Drawing and Spinning Frames, of which the following is a specification.

My invention relates to drag devices for bobbins of drawing and spinning frames.

This invention is applicable to the bobbins of so-called "gill-boxes," "drawing-boxes," "weigh-boxes," "finishing-boxes," and "flier spinning-frames" for worsted, flax, and other long fibers and to any machines in which a flier and spindle are used to twist sliver, slubbing, or yarn and in which the bobbin loosely surrounds the spindle and is rotated only by the pull of the ribbon or string of fibers delivered by the flier. In the open drawing and flier spinning of worsted and other long fibers this rotation of the bobbin is retarded by frictional contact with the lifter-plate or copping-plate on which the bobbin rests, and it is customary to put washers of cloth or leather on said plate around the spindle and under the bobbin and to vary the diameter of these washers to increase or diminish their retarding or dragging effect upon the bobbin, a washer of a diameter as large as the head of the bobbin dragging harder than a smaller washer. If there is not drag enough on the bobbin, the slubbing or yarn will be snarled, because the bobbin will be turned too far and by jerks by the action of the flier, and if there is too much drag on the bobbin the slubbing or yarn will be broken or pulled apart. When the bobbin is empty, it is more easily turned. When the bobbin is nearly full, its increased weight increases the friction on the washer and it is turned with difficulty. Besides, the bobbin must turn faster when nearly full and when the friction is greatest, because the speed of the flier is uniform, and an amount of slubbing or yarn which would reach entirely around the empty barrel of the bobbin will reach only a short angular distance on the circumference of the nearly-full bobbin, and if the speed of the bobbin were not increased as the bobbin is filled the slubbing or yarn would be broken by the flier. Again, evidently friction between the bobbins and the washers must depend partly on the weight of the empty bobbins and the smoothness or roughness of the surface of the bobbin which comes in contact with the washer, and great care must be used in selecting for the same machine bobbins as nearly as possible of the same weight and with heads unbroken and unscarred if any approximation to uniformity of product is expected. It is impracticable to stop the machine to adjust the friction or even to adjust the friction for each bobbin every time a new set of bobbins is to be filled.

The objects of this invention are to keep the retarding friction on the bobbins more nearly uniform while the bobbins are being filled to enable the friction devices to be more quickly and accurately adjusted and to render the operation of said friction devices independent of the smoothness or roughness of the bobbin-heads. These objects I accomplish by applying the retarding friction not directly to the bobbin, but to a plate which supports and turns with said bobbin and which is itself so supported that the increasing weight of the bobbin while being filled adds very little to the retarding effect or friction upon said plate.

In the accompanying drawings, Figure 1 is a front elevation of a pair of spindles provided with whirls and fliers, the spindle-supporting rails, the copping-plate or lifter-plate, and bobbins, together with my improved drag device; Fig. 2, a vertical central section of said drag device on the line 2 2 in Fig. 3 with parts of the copping-plate, spindle, and bobbin and the supporting-tube and adjusting and securing nuts in front elevation; Fig. 3, a plan of the drag device and a horizontal section of the spindle, the bobbin-supporting plate or friction-plate being broken away to show the antifriction-balls; Fig. 4, a plan of the bottom of the supporting-tube and friction-plate.

The step-rail A, the copping-plate or lifter-plate B, the top rail C, the live-spindle D, the

flier E, secured to and rotating with the spindle D, are of the usual construction as used in spindle gill-boxes and flier spinning-frames, the lifter-plate B having a vertical traverse to lay the slubbing or yarn delivered from the lower end of one of the arms *e* of the flier E upon the bobbin F. The two-headed bobbin or spool F is also of the usual construction, except as hereinafter stated. The spindle D and attached flier E are driven in the usual manner by a belt on a whirl *d*, secured to the spindle. The bobbin F loosely surrounds the spindle and is rotated only by the pull of the slubbing or yarn carried by the flier and is ordinarily retarded, as above stated, by frictional contact with a washer of suitable material, as cloth or leather, which rests upon the lifter-plate in contact with the lower head *f* of the bobbin.

I insert a vertical tube G in the lifter-plate B, said tube being vertically adjustable, as by means of an external screw-thread *g*, with which it is provided and which engages a corresponding thread in the hole in said lifter-plate. When the tube G is properly adjusted, it is locked in place by a check-nut H, which is turned on said tube up against the under side of said lifter-plate.

Above the plate B the tube G is provided with an external annular flange *g'*, which supports the friction-plate or bobbin-supporting plate I, the top of said plate I being as high as the upper end of said tube G. The friction between the plate I and flange *g'* is very slight, being diminished by antifriction-balls J, arranged in a circular groove g^2 in the top of said flange and holding said plate out of contact with the top of said flange. A flange *i* on the under side of the friction-plate I surrounds the flange *g'*, and said plate is retained on the flange *g'* by any convenient means, as by pins *i'*, which pass through the flange *i* below said flange *g'* to prevent said friction-plate from being accidentally lifted off from the flange *g'* and the balls from being displaced.

The friction-plate I is provided on top with upwardly-extending pins i^2 i^2, which enter corresponding holes f^2 in the under side of the lower bobbin-head *f*, causing said friction-plate to turn with said bobbin.

It will be seen that the friction between the plate I and the flange *g'* is very slight and is not greatly affected by the amount of slubbing or yarn on the bobbin and that with this device the smoothness or roughness of the lower bobbin-head has nothing to do with the drag of the bobbin. The necessary friction is applied to the plate I by a pad K, preferably in the form of a ring of suitable material, as leather, cloth, or felt, Fig. 2, which is arranged in a friction-cup L, surrounding the tube G below the flange *g'* and plate I and having an internally-threaded central hole *l*, which engages the screw on said tube, so that said cup may be raised by turning it on said tube to press the pad K more or less firmly against the plate I. When properly adjusted, the cup L is secured in place by the check-nut M, which turns on the tube G against the under side of said cup.

The flange *i* is preferably of the shape externally of an inverted frustum of a cone, and the internal shape of the pad K is such as to fit said flange *i*, it being found that the friction can be more effectually applied with this construction than when the top of the pad is flat and horizontal and applied to a similar surface on the bottom of the flange *i*.

It will be understood that the tube G, friction-plate I, cup L, and nuts H M are concentric with the spindle and that said tube G is out of contact with said spindle.

I claim as my invention—

1. The combination of a live-spindle, a flier, attached to and rotating with said spindle, a friction-plate, adapted to support a bobbin and to be rotated by the rotation of said bobbin, a friction device adapted to press upon said plate, and means of varying the pressure of said friction device upon said friction-plate without varying the height of said spindle and bobbin.

2. The combination of a live-spindle, a flier, attached thereto and rotating with said spindle, a lifter-plate, provided with a threaded hole, a tube, externally threaded and turning in said hole and provided with a flange, and a friction-plate, supported on said flange and adapted to support and positively engage a bobbin and to be rotated by the rotation thereof.

3. The combination of a lifter-plate, provided with a threaded hole, a tube, externally threaded and turning in said hole and provided with a flange, a friction-plate supported on said flange and adapted to support a bobbin and to be rotated by the rotation thereof, a friction-cup, having a central screw-threaded hole to engage the thread on said tube and a suitable pad, arranged in said cup below said friction-plate.

4. The combination of a tube, provided with a flange, an annular friction-plate, supported on said flange and having a downward extension which reaches below said flange, and locking means secured to said extension below said flange to retain said friction-plate on said flange.

5. The combination of a tube, provided with a flange, having an annular groove in its upper surface, antifriction-rolls, arranged in said groove, a friction-plate surrounding said tube and resting upon said rolls and adapted to support a bobbin and to be rotated by the rotation thereof, and means of preventing said friction-plate from being lifted off from said rolls.

6. The combination of a tube, provided with a flange, an annular friction-plate, me-

diately supported on said flange and having a downward extension, externally shaped like the frustum of an inverted cone, a cup, concentric with said tube and arranged below said friction-plate and adjustable on said tube, and a pad, arranged in said cup and internally shaped to fit said extension.

In testimony whereof I have affixed my signature in presence of two witnesses.

SAMUEL SMITH.

Witnesses:
ALBERT M. MOORE,
JAMES SMITH.