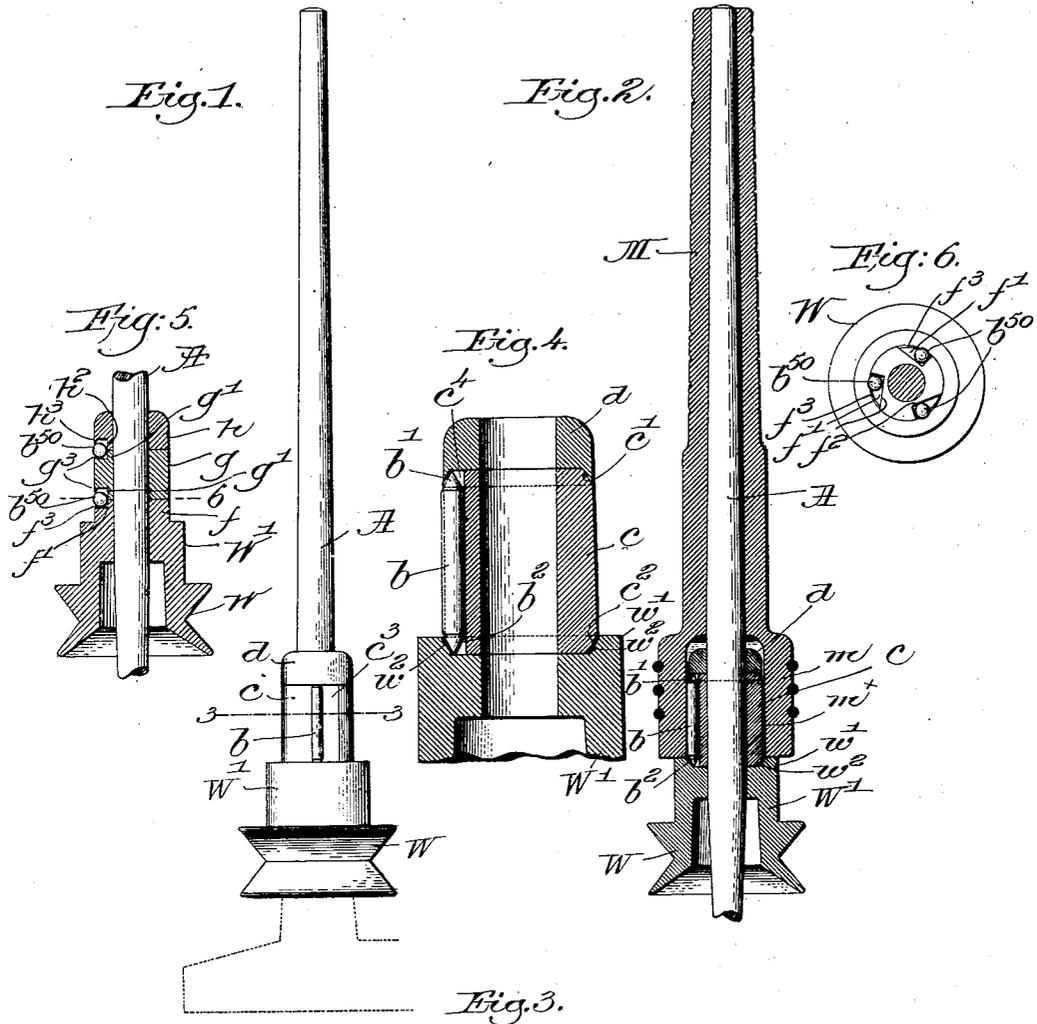


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BOBBIN RETAINING MEANS FOR ROTATABL SPINDLES.

APPLICATION FILED FEB. 27, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

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BOBBIN-RETAINING MEANS FOR ROTATABLE SPINDLES.

SPECIFICATION forming part of Letters Patent No. 734,922, dated July 28, 1903.

Application filed February 27, 1903. Serial No. 145,356. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. METCALF, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Bobbin-Retaining Means for Rotatable Spindles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of novel and simple means for retaining a yarn-receiver or bobbin in operative position upon the rotatable spindle of a spinning, twisting, or other similar apparatus.

In accordance with the present invention the bobbin is instantly clutched or held in operative position as soon as it is applied to the spindle, and the higher the speed of the latter the more tightly will the bobbin be held without any slip or lifting.

The bobbin-clutching means is simple and durable, and the application of the bobbin to the spindle or its removal therefrom is effected with equal readiness. The engagement of the bobbin by the clutching means is effected in a positive manner by a wedge-like action of cooperating parts or members, so that a very strong and efficient grip upon the bobbin is attained.

The various novel features of the invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a side elevation of a rotatable spindle having one embodiment of the present invention applied thereto. Fig. 2 is a longitudinal sectional view on the line 2 2, Fig. 1, the spindle and one of the clutching members being shown in elevation; a bobbin or yarn-receiver being shown in section. Fig. 3 is a considerably-enlarged transverse section on the line 3 3, Fig. 1, through the bobbin-retaining means. Fig. 4 is an enlarged longitudinal sectional detail of said means, omitting the spindle and the greater part of the whirl-sleeve. Figs. 5 and 6 are views of a modified form of the invention to be described, Fig. 6 being taken on the line 6 6, Fig. 5, looking down.

The rotatable spindle A, of any usual or well-known construction, is shown herein as having a rigidly-attached whirl W, secured to or forming part of the lower end of a sleeve W', rigidly attached at its upper end to the spindle, all in a manner familiar to those skilled in textile machinery and the construction thereof. In practice the sleeve extends down outside the top of the bolster-case or spindle-base B, partly shown in dotted lines, Fig. 1. The upper end of the sleeve W' is cut out to present an annular upturned flange w', having an inclined or beveled inner face w², (shown best in Fig. 2,) for a purpose to be described, and above the whirl-sleeve a second sleeve c is tightly secured to the spindle. The upper and lower ends of this sleeve are shown as frusto-conical at c' c', the lower end entering the depression in the top of the whirl-sleeve within the flange w', and a boss d, recessed in its lower end to receive the upper end c' of the sleeve, is secured to the spindle above the latter.

Preferably a plurality of elongated longitudinal and circumferentially equidistant and non-radial seats c³ are formed in the sleeve c by grooving it longitudinally, the seats c³ being secant planes intersecting the periphery of the sleeve and each seat at its inner end nearer the center of the sleeve terminating at an upright wall c¹, as clearly shown in Fig. 3. A clutch member (shown as an elongated roll b) cooperates with each seat, the ends of the rolls being tapered or conical at b' and b² to enter, respectively, the sockets formed by the recessed ends of the whirl-sleeve W' and boss d. The upper ends of the rolls are thus confined in proper working position while permitted a limited outward movement and also a rolling movement over the seats c³. The rolls are preferably of such diameter that when at the inner ends of the seats, and consequently nearest the axial center of the spindle, they project slightly beyond the periphery of the sleeve c, it being manifest that the nearer the rolls are to the outer ends of the seats the more will they be moved outward from the periphery of the sleeve.

In Fig. 2 a yarn-receiver or bobbin M, of

well-known construction, is shown in position on the spindle, the head m of the bobbin being internally recessed at m^x to slip over the retaining means, hereinbefore described. It will be manifest that when the spindle is rotated in the direction of the arrow 10, Fig. 3, the rolls will tend to move toward the outer ends of the seats c^3 , being thrown outward by centrifugal force, and when a bobbin is applied to the spindle the rolls will then be inclosed in wedge-shaped recesses formed by the seats and the wall of the recess m^x in the bobbin. The inclination of the seats thus causes the rolls to tightly engage or clutch the bobbin and hold it securely in operative position on the spindle without any slip or lifting thereon. In Fig. 3 the rolls are shown by dotted lines in clutching position, the inner wall of the recess of the bobbin being indicated by a heavy dotted line M^x .

The bobbin-retaining means is self-adapting to slight variations in the diameter of the bobbin-recesses, and it is instantaneous in its clutching action when a bobbin is brought into position to cooperate therewith. Inasmuch as the clutching action is increased by any resistance to rotation of the bobbin, it follows that when the spindle is running at high speed the bobbin cannot be removed therefrom by the operator. The bottom of the bobbin is shown in Fig. 2 as resting upon the top of the flange w' , the latter thus providing a definite support for the bobbin at the proper height relatively to the spindle and bobbin-retaining means.

In Figs. 5 and 6 the whirl W and sleeve W' , by which it is secured to the spindle A , are substantially as shown; but the clutch device is differently arranged to enable balls b^{50} to be used instead of rolls. Three collars f , g , and h are secured to the spindle, one above the other, Fig. 5, and above the sleeve W' , the collar f having in its upper face one or more pockets f' with cam-shaped back walls f^2 , Fig. 6, and a curved ball-retaining upturned lip f^3 . A clutch-ball is dropped into each pocket, and then the collar g is applied to the spindle, said collar having one or more pockets g' in its upper and lower faces with a cam-wall g^2 for each pocket and an overhanging lip g^3 , Fig. 5. The opposed lips f^3 and g^3 permit the periphery of the ball to extend beyond the outer circumference of the collars, but retain the balls loosely in the pockets, the cam-walls f^2 and g^2 being in the same vertical plane and acting to press the balls outward when they are moved toward the shallow outer ends of the pockets. Then a ball is placed in each of the pockets g' in the upper face of collar g , and the top collar h is applied, said collar having in its under face one or more pockets h' with a cam-wall h^2 and downturned lip h^3 , said pockets registering with the upper pockets g' , as will be manifest from an inspection of Fig. 5. The clutching action of the balls b^{50} upon the bob-

bin is practically the same as has been described for the rolls shown in the other figures of the drawings.

The terms "clutching-roll" and "clutching member" used hereinafter in the claims apply to the elongated cylindrical form of roll or to the ball.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a rotatable spindle, of a bobbin-clutching roll mounted thereon, and means to effect operative engagement of said roll with and to retain a bobbin on the spindle to be rotated thereby.

2. The combination with a rotatable spindle, of a bobbin-clutching member circular in cross-section and rotatably mounted thereon, and means to effect positive engagement of the said member with and to retain a bobbin on the spindle to be rotated thereby.

3. The combination with a rotatable spindle, of a bobbin-clutching roll mounted thereon, and loosely retained in place at its upper and lower ends, and means to force the roll into operative engagement with and to retain a bobbin on the spindle to be rotated therewith.

4. The combination with a rotatable spindle, of a plurality of bobbin-clutching members each of which is circular in cross-section and rotatably mounted thereon, and means to cause said members to positively engage a bobbin when the spindle is rotated, to retain the bobbin on and to effect its rotation with the spindle.

5. The combination with a rotatable spindle, of a plurality of bobbin-clutching rolls mounted thereon, motion-limiting sockets for the upper and lower ends of the rolls, and means to cause said rolls to engage a bobbin with a wedge action and hold it fast upon the spindle.

6. The combination with a rotatable spindle, of a plurality of bobbin-clutching rolls mounted thereon, non-radial seats for the rolls, and means to loosely retain the latter in place while permitting movement thereof upon the seats, the movement of the rolls toward the outer ends of the seats causing said rolls to operatively grip and hold a surrounding bobbin.

7. A spinning-spindle having an attached whirl, combined with a plurality of longitudinally-extended, non-radial seats above the whirl, and rolls outwardly movable upon the seats and having their upper and lower extremities confined but capable of limited movement, rotation of the spindle moving said rolls outward to be forced by the seats into operative clutching engagement with a bobbin when applied to the spindle.

8. The combination with a rotatable spindle having an attached whirl, of a bobbin-clutch member mounted on the spindle above the whirl and comprising a plurality of clutch-rolls and non-radial, longitudinally-extended

seats, movement of the rolls toward the outer ends of the seats forcing the rolls out radially into operative position.

5 9. The combination with a rotatable spindle, of a sleeve thereon having a plurality of elongated, non-radial plane seats, a bobbin-clutching member in rolling engagement with each seat, and means to confine the upper and lower ends of the members while permitting them to roll upon the seats and travel 10 bodily thereover toward and from the periphery of the sleeve.

15 10. The combination with a rotatable spindle having an attached whirl, of a sleeve surrounding the spindle above the whirl and having a plurality of non-radial, longitudinally-extended seats intersecting its periphery, and clutch-rolls rotatably movable upon the seats and adapted to engage and hold in place 20 a bobbin when applied to the spindle.

11. A rotatable spindle having a rigidly-attached whirl, a plurality of elongated bob-

bin-clutching rolls coaxial with the spindle and bodily rotatable therewith, non-radial seats carried by the spindle and on which said 25 rolls are movable into and out of clutching position, and means to position the upper and lower ends of the rolls while permitting limited movement thereof upon the seats.

12. A rotatable spindle, a yarn-receiver or 30 bobbin having an interiorly-recessed head, and bobbin-retaining means carried by the spindle to enter the recess, said means comprising a roll-clutch member, and a device to force positively the said member into wedge- 35 like engagement with the wall of the bobbin-recess.

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

CLARENCE E. METCALF.

Witnesses:

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