No. 741,638. PATENTED OCT. 20, 1903.

J. C. EDWARDS.

SPINNING SPINDLE.

APPLICATION FILED JUNE 29, 1903.

NO MODEL.

Fig: 1.

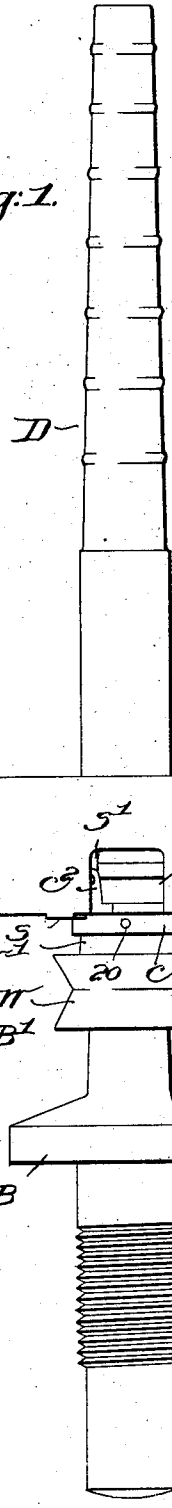


Fig: 2.

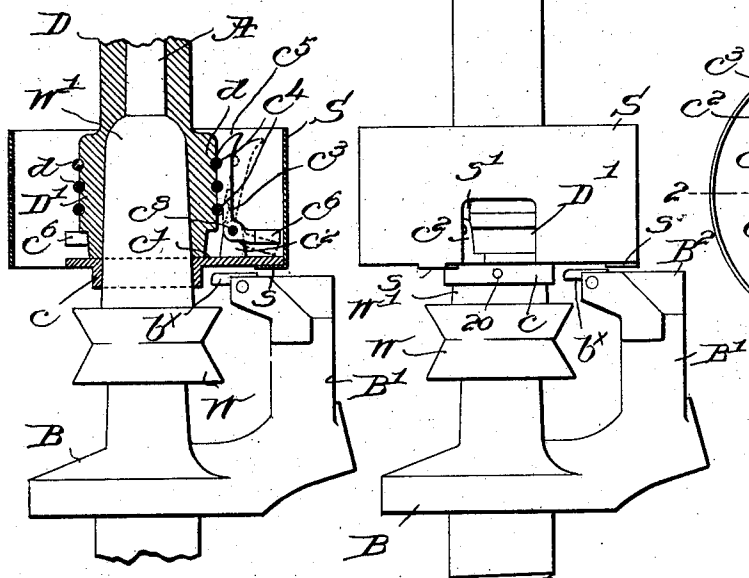


Fig: 3.

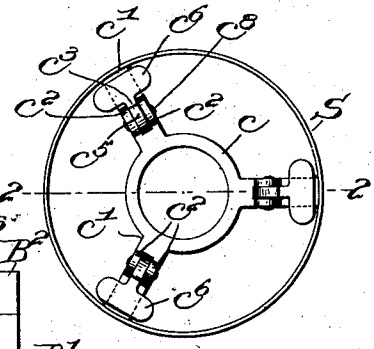
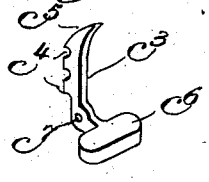


Fig: 4.



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No. 741,638. Patented October 20, 1903.

UNITED STATES PATENT OFFICE.

JOHN C. EDWARDS, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

SPINNING-SPINDLE.

SPECIFICATION forming part of Letters Patent No. 741,638, dated October 20, 1903.

Application filed June 29, 1903. Serial No. 163,618. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. EDWARDS, a citizen of the United States, and a resident of Brookline, county of Norfolk, State of Massachusetts, have invented an Improvement in Spinning-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 efficient means for retaining the yarn receiver or bobbin in operative position upon a live or rotatable spinning-spindle during the operation of laying the yarn upon the bobbin.

In my present invention I have constructed and produced simple bobbin-retaining means so arranged that the empty bobbin may be readily applied to the spindle and as readily removed therefrom or doffed, while the bobbin is retained firmly and securely in place by such means so long as the spindle continues to rotate. To this end I have utilized the centrifugal force due to rotation of the spindle in such manner that the bobbin is externally engaged and firmly held in operative position upon the spindle by the bobbin-retaining means.

The novel features of my 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 or live spindle and spindle-base with one embodiment of my novel bobbin-retaining means applied thereto, a bobbin being shown in operative position. Fig. 2 is a partial sectional detail on the line 2 2, Fig. 3, showing more clearly the construction and mode of operation of the bobbin-retaining means. Fig. 3 is a top or plan view of the bobbin-retaining means detached, and Fig. 4 is a perspective view of one of the clutching members.

The rotatable spindle A, of usual or well-known construction, is herein shown as having a rigidly-attached whirl W, secured to or forming part of the lower end of a sleeve W′, attached at its upper end to the spindle in a manner familiar to those skilled in the art, the sleeve in practice extending down outside the top of the bolster-case B, the latter having an oil snout or reservoir B′ and a hinged cover B^2 therefor provided with a downhold or projection $b^\times$ to prevent accidental lifting of the spindle, all of well-known construction.

In the present embodiment of my invention the bobbin-retaining means is shown as applicable to spindles of the type above referred to without any change in the structure thereof, whereby spindles now in use may readily and at small expense be fitted with my invention, though it will be manifest hereinafter that new spindles may be provided therewith with the same facility. Herein said retaining means is arranged to coöperate with bobbins D of the type used in automatic filling-replenishing looms, such as shown in United States Patent No. 529,940, the head D′ having annular projections or rings *d*, Fig. 2, to be engaged by the holding-jaws in the shuttle; but by varying the shape of the engaging faces of the clutching members they may be adapted for use with any desired form of bobbin.

Referring to Figs. 2 and 3, I have shown a carrier comprising a hub or collar *c*, adapted to lightly fit the whirl-sleeve W′ in the present embodiment of my invention and provided with a plurality of symmetrically-arranged radial arms *c′*, three being shown in Fig. 3, each arm having two upturned parallel ears c^2 thereon between the collar and outer end of the arm. A bobbin-clutching member is mounted on each arm, each composed of an elongated upturned body c^3, having its inner face notched at c^4 and outwardly beveled at c^5 at its upper end, the lower end of the body being turned outward and enlarged or thickened, as at c^6, to form a weighted extension heavier than the body c^3. (See Fig. 4.) The lower end of the body has a hole c^7 to receive a fulcrum-pin c^8, which is passed through and firmly held in the upturned ears c^2, the lower end of the body being inserted between them with the extension c^6 extending outward beyond the ears and substantially below the fulcrum. A pin 20, Fig. 1, may be driven through the collar *c* into the whirl-sleeve, if desired, to absolutely and rigidly confine the collar in place. When the spindle is at rest, the weight of the extensions c^6 will cause the bodies of the clutching members to swing outward away from the center of the spindle; but when the latter is rotating at speed the

centrifugal force will operate to lift the extensions, and thereby move the bodies c^3 inward on their fulcra c^8. Manifestly the space between the inner faces of the said members will then be reduced, and the construction is such that then this space will be smaller than that occupied by a bobbin-head.

When a bobbin is applied to the spindle, it is slipped down onto the whirl-sleeve, which it fits loosely and by which it is partly positioned, the head of the bobbin passing down between and spreading apart the clutching members against the centrifugal force by which they are controlled. As the bobbin is slipped down to position the notches c^4 receive the rings d on the bobbin-head, as shown clearly in Fig. 2, and the latter will be more tightly engaged and held the higher the speed of rotation of the spindle. Not only will the bobbin be rotated with the spindle, being firmly held by the clutching members, but the latter will also prevent any lifting of the bobbin during the operation of laying yarn thereupon.

The carrier is herein shown as forming a support for the bobbin to position it vertically, and by pushing a bobbin down to such support it will be manifest that the bobbin will always maintain a fixed vertical position with relation to the spindle.

The outwardly-beveled upper ends c^5 of the bobbin-clutching members facilitate the entrance of the bobbin-head between them, as will be manifest.

The bobbin can be readily removed or doffed without stopping the spindle by grasping the bobbin firmly enough to overcome the grip of the clutching members and stop it and then lifting it off the spindle.

When the spindle is at rest, the extensions c^6 drop down upon the arms c' beyond the ears c^2 and limit the outward movement of the clutching members on their fulcra, and when the spindle is running empty the clutching members will move inward until the extensions c^6, thrown upward by centrifugal force, attain a position of equilibrium.

The rapid rotative movement of the clutching members might increase the resistance due to air-pressure to an undesirable extent, and to obviate such resistance I have shown a wind shield or guard consisting of a thin, preferably metallic, plate S, bent into an annulus and secured to the arms c' by inturned ears s. The annular guard surrounds the clutching members and effectually overcomes the wind-pressure or resistance referred to. It will be seen that the arms c' extend outward above and quite close to the whirl down-hold $b^\times$ and reservoir-cover B^2, so that the latter cannot be tipped either to release the whirl or open the reservoir when the spindle is in motion.

When it is desired to release the whirl or open the reservoir, the spindle being at rest, it is turned until the opening s' in the shield S is above the cover B^2, said opening being located between two of the arms c', as shown in Fig. 1.

My invention is not restricted to the precise construction and arrangement herein shown and described, for so far as I am aware it is broadly new to provide a rotatable spindle with centrifugally-acting bobbin-clutching means to engage the exterior of a bobbin, and accordingly various changes or modifications may be made by those skilled in the art without departing from the spirit and scope of my invention.

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

1. The combination with a rotatable spinning-spindle, of centrifugally-acting bobbin-clutching members mounted to rotate therewith and free to move inwardly to engage the exterior of a bobbin and rotate the same with the spindle.

2. The combination with a rotatable spinning-spindle, of centrifugally-acting bobbin-clutching members mounted to rotate therewith, and axially arranged with relation thereto, said bobbin-clutching members being moved inward by or through rotation of the spindle to externally engage and hold a bobbin to rotate the same with the spindle.

3. The combination with a rotatable spinning-spindle, of upturned and axially-arranged centrifugally-acting bobbin-clutching members mounted to rotate with the spindle and free to move inwardly to externally engage and rotate a bobbin with the spindle.

4. The combination with a spinning-spindle, of a whirl-supporting sleeve secured thereto, a carrier mounted on the sleeve, and centrifugally-acting bobbin-clutching means mounted on the carrier and adapted to move inwardly to engage the exterior of and rotate a bobbin with the spindle.

5. The combination with a rotatable spinning-spindle, of a plurality of upturned centrifugally-acting bobbin-clutching members mounted to rotate therewith and symmetrically arranged with relation to its axis of rotation, said members being free to move inwardly and engage externally and hold a bobbin to rotate with the spindle.

6. The combination with a rotatable spinning-spindle, of a sleeve secured thereto and having an attached whirl, and a plurality of centrifugally-acting bobbin-clutching members mounted on the sleeve above the whirl and symmetrically arranged with relation to the axis of the spindle, said members being moved inward by or through rotation of the spindle to externally engage and hold the head of a bobbin and effect rotation thereof with the spindle.

7. The combination with a rotatable spinning-spindle, of upturned bobbin-clutching members fulcrumed at their lower ends to move toward and from the axis of the spindle, and weighted extensions below the fulcra of said members, upwardly movable by cen-

trifugal force to move the members inward to externally engage and hold the head of a bobbin when inserted between them.

8. A spinning-spindle, having in combination a whirl, a whirl-sleeve, and clutching members pivotally mounted at their lower ends on the outside of the whirl-sleeve, each member having a heavier radial extension below its fulcrum.

9. A spinning-spindle having an attached whirl-sleeve, a series of upturned bobbin-clutching members mounted upon the sleeve and fulcrumed near their lower ends to swing toward and from the spindle, each member having a heavier radial extension below its fulcrum, upwardly movable by centrifugal force upon rotation of the spindle, to swing inward the upturned members, and means to limit outward movement of said members when the spindle is at rest.

10. A rotatable spinning-spindle, a carrier rotatable therewith, and a plurality of upturned, centrifugally-acting bobbin-clutching members fulcrumed thereon near their lower ends, the inner faces of said members being shaped to externally engage and hold a bobbin-head and each having a heavier radial extension below its fulcrum, upwardly movable by centrifugal force upon rotation of the spindle.

11. A rotatable spinning-spindle, a carrier rotatable therewith, a plurality of upturned, centrifugally-acting bobbin-clutching members fulcrumed thereon near their lower ends and each having a heavier radial extension below its fulcrum, and an annular wind-shield surrounding said members.

12. A rotatable spinning-spindle having an attached sleeve provided with a whirl, a carrier comprising a collar to tightly fit the sleeve and having a plurality of radial, symmetrically-arranged arms, and a centrifugally-acting bobbin-clutching member mounted on each of said arms.

13. A rotatable spinning-spindle having an attached sleeve provided with a whirl, a carrier comprising a collar to tightly fit the sleeve and having a plurality of radial, symmetrically-arranged arms, each having upturned ears, and an upturned bobbin-clutching member fulcrumed near its lower end on the ears of each arm and having a weighted radial extension below its fulcrum.

14. A rotatable spinning-spindle having an attached sleeve provided with a whirl, and a plurality of upturned, centrifugally-acting bobbin-clutching members axially arranged about and mounted to rotate with the spindle, the inner faces of the members having notches to engage annular rings or projections on a bobbin-head, and being beveled outwardly at their upper ends.

15. The combination with a rotatable spinning-spindle, of centrifugally-acting bobbin-clutching members mounted to rotate therewith and free to move inwardly to engage the exterior of a bobbin and rotate the same with the spindle, and an annular wind-shield inclosing said members and rotatable with the spindle.

16. Bobbin-clutching means for spinning-spindles, comprising a carrier adapted to be connected with the spindle to rotate therewith, and a plurality of upturned centrifugally-acting clutching members mounted on the carrier and inwardly movable to engage and hold the exterior of a bobbin-head.

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

JOHN C. EDWARDS.

Witnesses:
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EMILY C. HODGES.