P. E. McCULLOUGH.

BOBBIN CLUTCHING MEANS FOR ROTATABLE SPINDLES.

APPLICATION FILED NOV. 28, 1908.

916,358. Patented Mar. 23, 1909.

Fig: 1.

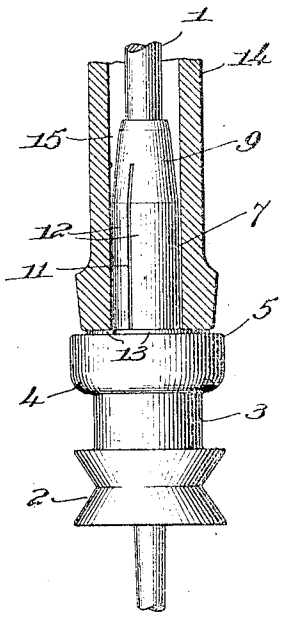


Fig: 2.

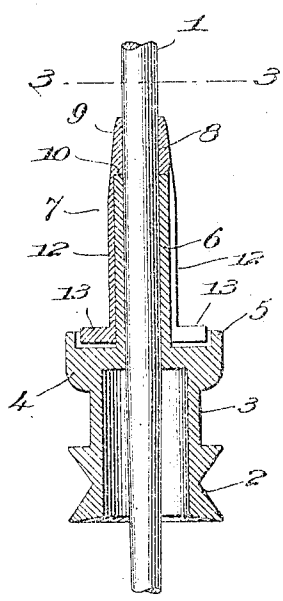
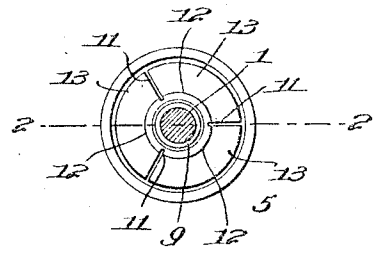


Fig: 3.



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UNITED STATES PATENT OFFICE.

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BOBBIN-CLUTCHING MEANS FOR ROTATABLE SPINDLES.

No. 916,358. Specification of Letters Patent. Patented March 23, 1909.

Application filed November 28, 1908. Serial No. 464,956.

To all whom it may concern:

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

This invention has for its object the production of novel means for retaining in position and driving a yarn-receiver or bobbin placed upon a rotatable spinning, twisting or other similar spindle, the bobbin connecting or clutching means being so constructed and arranged that the centrifugal action due to rotation of the spindle is made effective to hold firmly and drive the bobbin in unison with the spindle.

Various forms of centrifugally-acting bobbin-clutching means have been devised, having similar objects in view, but herein the construction has been simplified and cheapened and the novel features to be described hereinafter serve to increase the efficiency of the device in several important particulars.

In the present embodiment of my invention the clutching means comprises an elongated cast-metal sleeve of suitable external shape to enter the base of the bobbin, the lower end of the sleeve having an annular lateral enlargement, and by longitudinally slitting the sleeve through said enlargement and upward toward its upper end a plurality of resilient and elongated arms are provided, integrally connected at their upper ends by a continuous collar and each having at its lower end a segmental, lateral foot. The upper end or continuous collar of the sleeve is fixedly attached to the spindle and the feet at the lower ends of the depending arms enter loosely a cup-like container fixed on the spindle, the feet forming a bobbin-rest. When the spindle is rotated the centrifugal action moves the arms outward to firmly and effectively engage and grip the bore of the bobbin at the base or butt thereof, this gripping action being increased by making the feet relatively heavy. The container serves to limit outward movement of the free, lower ends of the clutching arms and also prevents any liability to rupture the arms at their upper ends or elsewhere, and also presents a smooth peripheral edge around the outer edges of the feet, obviating any chance of the operator injuring his hands while performing his work.

The various 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 portion of a rotatable spindle with one embodiment of my present invention applied thereto, with the lower part of a bobbin shown in section in operative position thereon; Fig. 2 is a vertical section on the line 2—2, Fig. 3, but with the spindle in elevation; Fig. 3 is a horizontal section on the line 3—3, Fig. 2, looking down.

I have shown my invention in connection with a spindle of the sleeve-whirl type, the spindle 1 having a whirl 2 formed on a relatively large sleeve 3, the latter at its upper end having a circular head 4 provided with an upturned annular flange 5, constituting a cup-like container, as clearly shown in Fig. 2. A central tubular extension 6 projects upward from the container and is adapted to be forced onto the spindle preferably with a driving fit, to thereby fixedly attach the whirl and container to the spindle. The whirl, container and tubular extension are preferably made as a casting.

The clutching means I prefer to make as a casting, and comprises an elongated sleeve 7 preferably made somewhat thicker at its upper end, at 8, and externally tapered at 9, the lower end of the sleeve being laterally extended to form an annular enlargement, also made thicker than the body or main portion of the sleeve. Internally the diameter of the main portion of the sleeve is such that it will fit easily over the extension 6, leaving an internal shoulder 10, Fig. 2, which in practice abuts against the top of the extension when the parts are assembled. The thickened part 8 forms a strong and continuous collar which is preferably forced with a driving fit onto the spindle and thereby is fixedly secured thereto.

The sleeve 7 is longitudinally slitted from its lower end upward to the part or collar 8, as at 11, and referring to Fig. 3 I have shown three slits equi-distant from each other, the slits extending to the periphery of the annular enlargement, so that the sleeve is divided into a plurality of elongated resilient arms 12

each having at its lower end a segmental foot 13, and connected integrally at their upper ends by the collar 8.

As shown in Fig. 2 the segmental feet 13 enter loosely the container, a slight clearance being left between their peripheral edges and the flange 5, the upper faces of the feet being slightly above the top of said flange, while there is a space between the feet and the bottom of the container, to permit the requisite movement of said feet. When the spindle is rotated the centrifugal force acts to move outward the arms and their feet, such movement being limited by the container so that there is no possibility of rupture of the arms at high spindle speeds, the resiliency of the arms causing them to contract or move inward as the speed decreases. Supposing the spindle to be rotating, with the arms 12 pressed outward by centrifugal action, if a bobbin 14 is applied to the spindle, Fig. 1, the taper 9 readily enters the bore 15 in the base of the bobbin and as the latter is pressed down upon the arms they will be pushed inward, the feet 13 forming a bobbin-rest as shown in Fig. 1. The centrifugal action, however, causes the arms to impinge against the wall of the bore 15 and tightly hold the bobbin on the spindle to rotate in unison with it. A bobbin can be readily applied to the spindle and it can be as readily removed, as the power necessary to apply or remove the bobbin is only sufficient to overcome the expanding action of centrifugal force on the arms 12. The bobbin is always supported at a fixed height with relation to the spindle by the engagement of the lower end of the bobbin with the rest formed by the feet 13. By making the latter relatively thick, as shown, the expansive or clutching action of the arms 12 is increased without in any way detracting from their own resiliency, as will be manifest. The smooth surface presented by the cup-like container obviates any danger to the operative, as the separated feet are protected and guarded so that the fingers or hands cannot be cut or injured. Assemblage of the various parts is easily and quickly effected, and secure attachment of the clutching means and the container to the spindle is readily attained. The external diameter of the clutching arms is such that only a relatively slight enlargement of the bore in the base of the spindle is necessary, which is of advantage as thereby less of the wood of the bobbin has to be removed, insuring the strength of the bobbin where most desirable.

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

1. Centrifugally-acting bobbin-clutching means for rotatable spindles, comprising an elongated metallic sleeve externally tapered and thickened at its upper end to form a continuous collar and having an annular, laterally extended enlargement at its lower end, the sleeve being longitudinally slitted from the lower end of the collar downward through the enlargement to present a plurality of elongated and integral resilient arms each having a broad segmental foot, said arms and their feet being moved outward by centrifugal action, and a cup-like container into which the feet enter and by which their peripheral edges are loosely embraced, whereby outward movement of the feet is limited, the container and the continuous collar at the upper end of the sleeve being adapted to be fixedly attached to a spindle, the flat upper faces of the feet, being slightly above the top of the container and constituting a bobbin-rest.

2. In combination, a rotatable spindle, an elongated, thin metallic sleeve having its upper end thickened to form a continuous collar fixedly attached to the spindle and having its lower end laterally extended and thickened to form an annular enlargement, the lower end of the collar presenting an internal annular shoulder, the sleeve being longitudinally slitted from said enlargement up to the shoulder of the collar to form a plurality of resilient arms each having a segmental, lateral foot, and a cup-like container on the spindle to loosely embrace the peripheral edges of the feet and limit outward movement thereof.

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

PETER E. McCULLOUGH.

Witnesses:
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