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1,592,784

O. K. SMITH

BOBBIN

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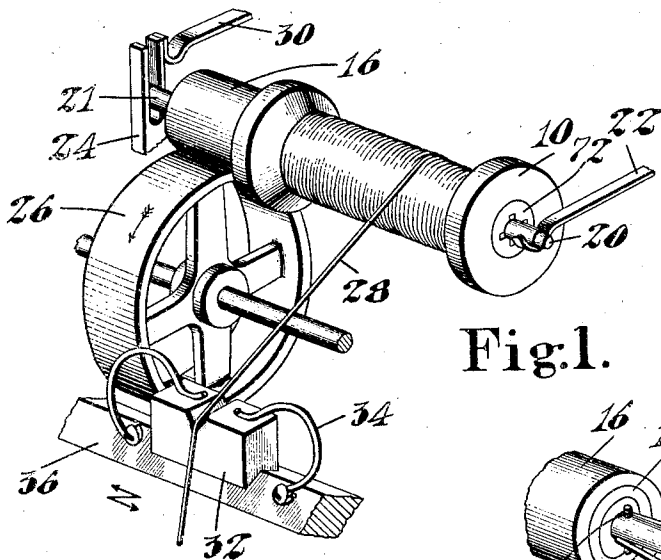


Fig. 1.

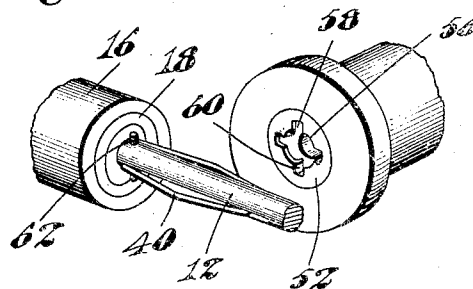


Fig. 2.

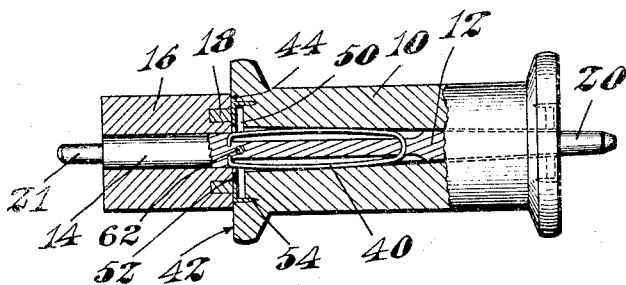


Fig. 3.

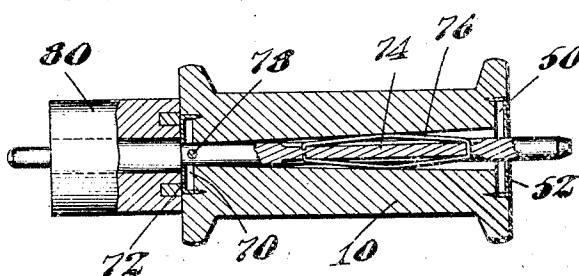


Fig. 4.

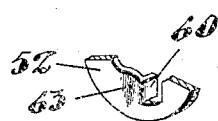


Fig. 5.

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BOBBIN.

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This invention relates to bobbins and is illustratively shown as embodied in a bobbin of a type suitable for use in silk throwing and finishing machines.

5 Silk throwing and finishing machines, such as spinners, doublers, winders and the like, must be designed with due regard to the delicate and fragile character of the material being treated. To this end, they are
10 commonly arranged with frictionally driven spindles upon which are mounted bobbins commonly held frictionally upon the spindle. As the thread is guided to the bobbin and is laid evenly thereon, it frequently happens
15 that slight tangles upon the reels, or other irregularities, cause a twitching of the thread being wound upon the bobbin and hence of the bobbin itself in opposition to the driving force. These repeated twitches
20 tend to turn the bobbin upon the spindle and sometimes to displace it axially with a resulting disastrous piling up of the thread at one end of the spool member of the bobbin or around the spindle outside the bobbin.
25 Accordingly, an object of the invention is to provide an improved bobbin arranged for positive driving engagement with its spindle and so arranged that it cannot become laterally displaced with respect to the
30 spindle.

In accordance with important features of the invention, the end surface of the spool member of the bobbin is tightly held detachably in engagement with a transverse
35 flange upon the spindle by means of a bayonet joint comprising a projecting pin in the spindle and a partially covered or undercut recess in the end surface of the spool member. Preferably the recessed end surface
40 of the spool member is covered by means of a novel radially slotted cap or lock plate having intumed stop lugs adjacent to each slot which serve the dual function of guiding the projection upon the spindle as it is inserted
45 in and withdrawn from the undercut recess and also providing a positive driving engagement with said projection. After the bobbin has been brought into driving relation upon the spindle, relative axial displacement is effectually prevented by intumed portions forming depressions in the cap plate, locking the bobbin to the spindle.
50

Another object of the invention is to provide a reversible bobbin arranged to be held in firm driving engagement with its spindle in either position. Another feature of the

invention relates to a bobbin having a tapered axial bore and arranged so that it may be used upon either a tapered or a non-tapered spindle in proper position and in
60 good driving engagement, eliminating the screw button formerly necessary for holding the bobbin upon the non-tapered spindle.

A preferred embodiment of the invention is described in the following specification
65 and illustrated in the accompanying drawing in which—

Fig. 1 is a perspective view of a bobbin in operative relation to some of the associated
70 parts of a machine;

Fig. 2 is an exploded view in perspective showing the co-operating parts at the adjacent faces of a spindle and a bobbin;

Fig. 3 is a longitudinal section through the axis of a spindle and bobbin;
75

Fig. 4 is a similar view of a bobbin mounted in reverse position upon a non-tapered spindle; and

Fig. 5 is a perspective view of a fragment of the lock plate on a larger scale.
80

The bobbin comprises a spool member 10 having an axial bore tapered toward one end to facilitate its positioning upon a similarly tapered portion 12 of a spindle 14. The spindle has a cylindrical head 16 in
85 which there has been inserted a weight 18 and its ends 20 are reduced and adapted to be received respectively in a hooked bracket 22 or a slotted member 24. When placed in a machine such as that illustrated by way
90 of example, the head 16 rests against a friction wheel 26 as it is guided up and down by the end 21 floating in the slot of a member 24 and is rotated frictionally to wind up
95 thread 28 upon the bobbin carried by the spindle. When it is desired to stop the rotation of the bobbin, the spindle may be lifted, manually or automatically, out of engagement with the friction wheel and its
100 end 21 dropped in a hooked bracket 30 attached to the slotted member 24, whereby it will be held out of driving engagement. The thread 28 may be guided to the bobbin and laid evenly thereon by means of a
105 grooved porcelain guide 32 detachably held by curved springs 34 upon a reciprocable traverse bar 36. This bar may conveniently be reciprocated by a cam or similar device, not shown, to distribute the thread evenly
110 upon the bobbin.

As in a common commercial construction, the spindle 14 may be grooved longitudi-

nally to receive the sides of a looped wire spring 40 the middle of which is passed through an opening in the tapered portion 12 and the ends of which are intumed and
 5 received in recesses or sockets in the spindle adjacent to the ends of the grooves. This spring 40 serves to centralize the bobbin upon the spindle and helps to prevent its displacement but is no longer an assential feature of the arrangement. It is found, however, that, in spite of the frictional engagement between the bobbin and the spindle either with or without the assistance of a spring 40, irregularities in the skein of silk
 10 thread 28 tend to make the thread catch momentarily and may displace the bobbin axially upon the spindle and thereby jerk the end surface 42 of the spool member out of contact with the adjacent transverse flange 44 formed by the end surface of the head 16 of the spindle. This is a constant annoyance to the operative and a source of loss to the manufacturer because of the waste produced as the silk rides over the
 15 end of the spool and piles up around the spindle.

In order to produce a positive driving engagement of the bobbin by the spindle and to prevent longitudinal displacement of the
 20 bobbin upon the spindle, the end surface 42 of the spool member is provided with a central recess 50 which is covered by means of a lock plate formed as a cup-shaped cap 52. This may be secured in place in any desired
 25 manner, as by driving the rim 54 of the cup into the wood of the spool member 10, said rim being designed just to fit the recess 50. The bottom of the cup is flush with the end surface 42 and forms a cover for the recess
 30 50, it being provided with a central opening 56 coinciding with the bore of the bobbin. Around this opening radial slots 58 have been cut in the cap 52 and the metal removed from the slots has been turned inwardly to form stop lugs 60. The spindle
 35 has a driving projection in the form of a transverse pin 62 inserted in the spindle closely adjacent to but spaced from the flange 44 and this pin projects radially from
 40 the spindle to an extent slightly less than the depth of the slots 58. When the separated parts shown in Fig. 2 are brought into the position shown in Fig. 3, the ends of the pin 62 are entered in opposite slots
 45 58. Preferably, the bobbin is given a quarter turn counter-clockwise, as viewed in Fig. 1, with respect to the spindle to bring the ends of the pin 62 into the undercut recess formed by the slotted cap 52 and against the stops provided by the lugs 60 to give a positive driving engagement. Depressions
 50 63 (Fig. 5) in the cap 52 form portions curved in the direction of the length of the spindle which co-operate with the projecting pin 62 automatically to draw the faces

42 and 44 firmly together into locked engagement and thereby to prevent axial movement upon the spindle or accidental
 55 rotative movement in either direction with respect to the spindle. When it is desired to remove the bobbin from the spindle, it may nevertheless be turned readily in the opposite sense until the pin 62 contacts with the other lugs 60 after which the bobbin may be removed axially from the spindle against
 60 the friction of the spring 40, the pin 62 being guided out of the recess by said lugs.

In the course of the various processes of silk throwing, it may be desired to reverse the direction of rotation of a bobbin. Accordingly, the other end of the bobbin adjacent to the small end of the tapered bore is preferably recessed at 70 and provided with a similar slotted cover member or cap 72. This allows the bobbin to be reversed and used as shown in Fig. 4 in connection with an untapered spindle 74 small enough to enter the small end of the tapered bore. This form of spindle may be provided with a similar spring 76 positioned farther
 70 out toward the free end of the spindle to centralize the bobbin thereupon. A similar pin 78 is provided in the spindle adjacent to the body 80 and this co-operates with the undercut recess and lugs provided by the cap 72 to draw together the bobbin and spindle and positively to drive the bobbin. With the bobbin in use on an untapered spindle, the firm locking engagement provided by the depressions 63 in co-operation with the pin 78 renders the spring 76 and the screw button formerly employed unnecessary.

It should be noted that the size of the central opening of each cap, such as that at 56, depends on the radius of the bore of the spool at that end and that the radius of the slots 58 equals that radius plus a constant dimension which is dependent upon the projection of the pins 62 and 78 beyond the
 105 spindle.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A bobbin adapted to be mounted upon a spindle comprising a spool member having an axial bore to receive the spindle, said spool member having means adjacent to one end adapted to co-operate with a portion of said spindle constructed and arranged automatically to draw the cooperating parts firmly together and lock them thereby to prevent axial movement of the bobbin upon the spindle and accidental rotative movement in either direction with respect to the
 115 spindle.

2. A bobbin adapted to be mounted upon a spindle comprising a spool member having an axial bore to receive the spindle and an end surface provided with a circular recess
 120 125 130

forming an enlargement of said bore, a cover member attached to said spool over said recess, said cover member having an opening for the spindle which is enlarged in one locality to provide for the admission into that portion of the recess which is beneath the cover of a projection upon the spindle, and a stop for said projection within the covered part of the recess whereby the bobbin may be locked to the spindle.

3. In combination, a spindle having a transverse flange, a bobbin mounted upon said spindle having an end surface adjacent to said flange, and means for maintaining the relation of said end surface and said flange comprising a bayonet joint provided by a pin projecting radially from said spindle and a recess cut in the end surface of the bobbin and partially covered by a lock plate having an intumed lug forming a stop for the pin.

4. In combination, a spindle provided with a driving projection, a bobbin adapted to be mounted upon said spindle having a stop co-operating with said projection whereby the bobbin may be driven with the spindle, and means for preventing axial displacement of the bobbin upon the spindle and accidental rotative movement in either sense with respect to the spindle.

5. A bobbin adapted to be mounted upon and driven from a spindle, said bobbin comprising a spool member having an end recess covered by a sheet metal cap cut away to provide a plurality of substantially radial slots the cut-away metal being turned inwardly to form lugs and recesses adjacent to said slots, said lugs being arranged to serve both as guides to the slots and as stops limiting the recesses arranged to co-operate with a projecting portion of the spindle when said portion is positioned thereagainst after having been passed through one of said slots into a recess.

6. A reversible bobbin comprising a spool member provided with an axial bore and adapted to be mounted upon a spindle having a projecting pin, said spool member having a recess adjacent to each end of the bore, and cover members over each of said recesses provided with radial slots to receive said pin and stops adjacent to the slots to coact with the pin.

7. A reversible bobbin comprising a spool

member having a tapered axial bore and adapted to be mounted upon a spindle having a projecting pin, said spool member having recesses adjacent to each end of the bore and caps over each of said recesses having radial slots the radius of which equals the radius of the bore at that end plus a constant dimension, to receive said pin.

8. In combination, a spindle provided with a transverse flange, a projecting pin adjacent to said flange, and a bobbin adapted to be mounted upon said spindle comprising a spool member having a bore, an end recess adjacent to said bore, and a cap for said recess having a slot to allow said pin to enter the recess, said cap being constructed and arranged to draw the spool against the flange of the spindle as the spindle is turned after the pin has been inserted in the recess.

9. In combination, a spindle provided with a transverse flange, a projecting pin adjacent to said flange, and a bobbin adapted to be mounted upon said spindle comprising a spool member having a bore, an end recess adjacent to said bore, and a cap for said recess having a slot to allow said pin to enter the recess, said cap having a portion curved in the direction of the length of the spindle and co-operating with the pin to draw the bobbin against the flange of the spindle.

10. A lock plate for a bobbin provided with substantially radial slots for the admission of a projecting pin upon a spindle, said plate having lugs adjacent to the slots and depressions between the lugs and the next adjacent slot to assist in locking the bobbin against axial displacement upon a spindle.

11. A sheet metal lock plate adapted to be attached to a bobbin and form a cover for a recess in the end of the bobbin, said plate having a central opening and a portion cut away adjacent to said opening and turned inwardly thereby to form a substantially radial slot for the admission of a projecting pin upon a spindle and also to form an intumed lug to cooperate with said pin to prevent relative rotation of the bobbin and the spindle in one direction.

In testimony whereof I have signed my name to this specification.

OLIVER K. SMITH.