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SEWING MACHINE BOBBIN WINDER.

APPLICATION FILED AUG. 21, 1913.

1,160,604. Patented Nov. 16, 1915.

Fig. 1.

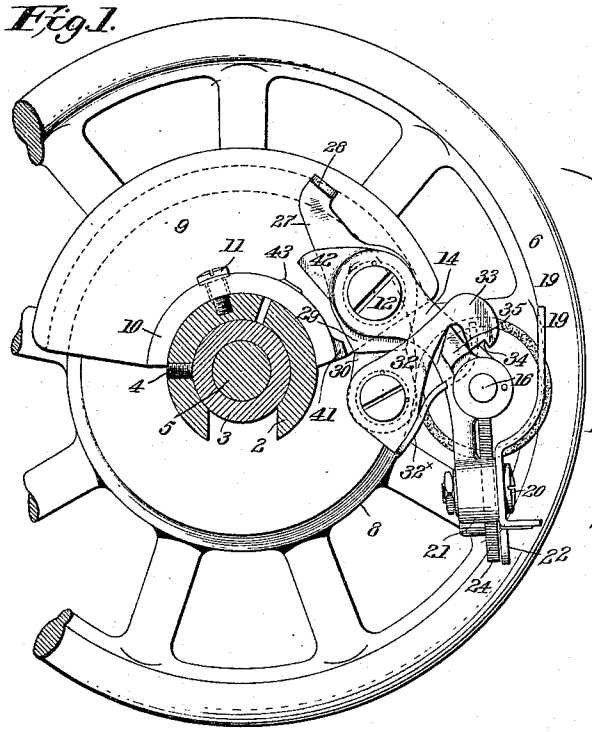


Fig. 2.

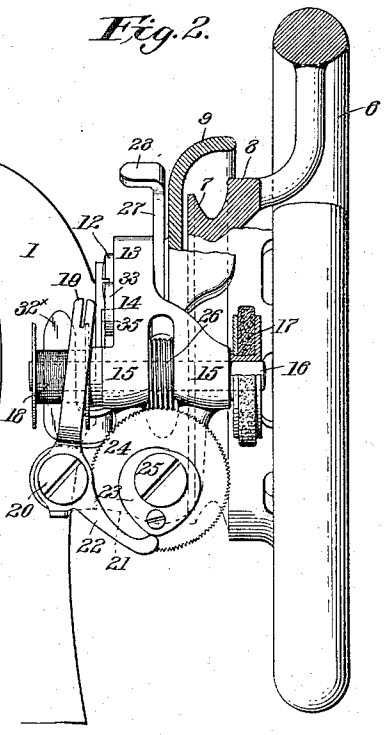


Fig. 3.

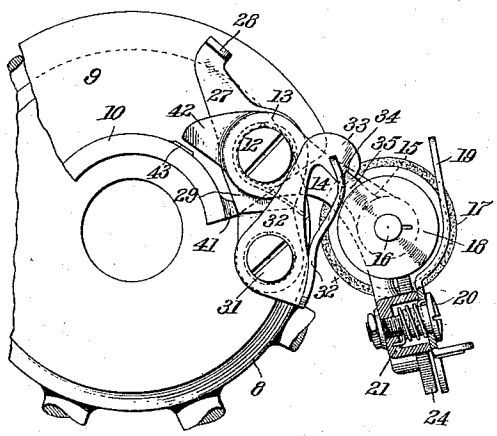
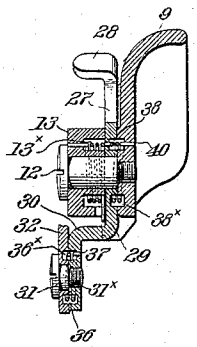


Fig. 4.



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SEWING-MACHINE BOBBIN-WINDER.

1,160,604. Specification of Letters Patent. Patented Nov. 16, 1915.

Application filed August 21, 1913. Serial No. 785,844.

To all whom it may concern:

Be it known that I, MARTIN HEMLEB, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machine Bobbin-Winders, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to bobbin-winding devices for sewing machines, and more particularly to devices of this character adapted to be driven through direct contact with the balance-wheel of a sewing machine, the object of the invention being to improve the construction subject of patent to McFarlane, No. 961,154 of June 14, 1910, while retaining the substantial elements thereof.

In the present construction, the bobbin-spindle and driving-wheel of the bobbin-winding attachment are carried by a swinging arm mounted by means of a fulcrum stud upon a belt guard overhanging the grooved hub of the balance-wheel, a runway being formed upon the hub to transmit motion to the bobbin-driving wheel. Upon said fulcrum stud, and intermediate the swinging arm and the belt guard, is mounted a lever which carries a spring-pressed latch hook. The swinging spindle-carrying arm is spring-pressed upwardly from the runway and is held in its operative position against the stress of said spring by the latch hook—the latter automatically releasing said arm at the end of the bobbin-winding operation, thus permitting the arm to carry the driving-wheel out of contact with the runway. While the latch holds the arm and its driving-wheel in operative position, the arm and the latch carrying lever are locked together, and the thrust of a spring interposed between the lever and the belt-guard is transmitted to said arm, whereby the non-resilient rim of the driving-wheel is spring-pressed against the face of the runway.

The McFarlane construction, subject of the patent above referred to, employs the elements just described, with the exception that a rubber rim is used for the driving wheel and driving contact between the latter and the runway depends entirely upon the resiliency of said rubber rim—the latch carrying lever being maintained in fixed position except during adjustment. In attachments of the type illustrated by the McFarlane patent above referred to, the use of the resilient rim upon the bobbin-driving wheel renders the effectiveness of the attachment dependent upon the continued resiliency and form of the rim. The rim must be highly resilient, must retain its form, and must offer resistance to wear. The only practical material which possesses the above characteristics is rubber, but rubber is objectionable because it quickly becomes oxidized under certain atmospheric conditions, and it is affected by the oil used upon the attachment and upon the sewing machine. In the present invention the bobbin may be driven by a wheel having a wear-resistant, non-resilient rim, such as steel, indurated fiber, or compressed felt, inasmuch as spring-pressure is applied to the wheel, as hereinbefore pointed out.

In the McFarlane construction it is impossible to provide the lever with a spring to thrust the driving wheel into spring contact with the runway, because such spring would render the latch ineffective. The disengagement of the latch from the spindle-carrying arm would permit the lever to spring downward while the arm would remain stationary, the wheel maintaining its contact with the runway. And a stop device, employed to prevent downward movement of the lever after release of the arm, would render the spring ineffective, the thrust of the latter being held by such stop device. In the latter case the driving-wheel after being brought into contact with the runway, would be held by the latch against the stress of the spring of the swinging arm; but, should the driving-wheel rim be formed of non-elastic resistant material, the contact would be ineffective to transmit the necessary motion.

In the present invention, the latch carrying lever is given a downward thrust by a spring as aforesaid, and a stop is provided for limiting the downward movement of the lever, whereby the spindle carrying arm, upon its release by the latch is permitted to move upward to carry the driving-wheel out of contact with the runway. In throwing the attachment into operative position, a lever finger-piece is depressed to move the lever upwardly against the stress of its spring and away from the stop, the spindle-carrying arm being held in its inoperative position by a stop device. When the up-

ward movement of the lever carries the spring-latch into position to lock the arm and lever together, pressure upon the finger-piece of the lever is discontinued and the lever is permitted to move the arm downwardly thereby carrying the driving-wheel into contact with the runway against the face of which it is pressed by the lever spring.

In the accompanying drawings, Figure 1 is a front side elevation of the bobbin-winding attachment in operative relation with a sewing machine balance wheel, the supporting shaft and bearing therefor afforded by the sewing machine frame being in transverse section. Fig. 2 is a side view of the parts represented in Fig. 1 showing a portion of the balance-wheel and the belt-guard in section. Fig. 3 is a partial side elevation of the part shown in Fig. 1 with the bobbin-winder in retracted position. Fig. 4 is a transverse section of the belt-guard, the swinging arm which carries the driving wheel, and the latch carrying lever, showing the relation of such parts and the tension-springs therefor.

At the rear end of the sewing machine standard 1 is formed a bearing boss 2 containing a bushing 3 secured in said boss by set-screw 4 and affording a bearing for the main-shaft 5 upon the rearward end of which is mounted balance-wheel 6. The balance wheel is provided with the usual annular groove 7 to receive the driving belt, and with a cylindrical portion 8 adjacent said groove to afford a runway for the driving-wheel of the bobbin-winder.

Overhanging the balance-wheel hub is a segmental belt-guard 9 provided with a segmental flange 10 secured by means of the fastening screw 11 upon the bearing boss 2 of the machine frame. Upon the side of the belt guard is a fulcrum screw stud 12 upon which is mounted the hub 13 of a swinging arm 14 forked in its opposite end and provided with bearing bosses 15 in which is mounted the rotary spindle 16 which carries the driving wheel 17, the latter, in this instance, being provided with a groove to receive a non-elastic rim. The rim may be formed of steel, indurated fiber, or other resistant material. The rearward bearing boss 15 of the swinging arm 14 overhangs the belt groove 7 of the balance wheel 6, and the driving wheel of the attachment is thus disposed suitably for securing its contact with the runway 8 of said balance-wheel. The opposite end of the spindle 16 projects beyond the corresponding bearing boss 15 to receive the usual disk-bobbin 18 to which the thread is guided by means of notched vibrating arm 19 of a rock-lever fulcrumed by means of screw-stud 20 upon the lateral-ear of an extension 21 formed upon swinging-arm 14. The rock-lever is provided with a second arm 22, engaging actuating-cam 23 upon the worm-wheel 24 pivotally mounted by means of a stud 25 upon said extension 21 of swinging-arm 14 and meshing with worm 26 fixed upon the rotary-spindle 16.

Mounted upon the stud 12 and intermediate the swinging-arm 14 and the belt-guard 9 is a latch-carrying lever having an arm 27 formed with an offset finger-piece 28 and provided with a second arm 29 having an offset portion 30 which supports the fulcrum 31. Upon the fulcrum-pin 31 is pivotally mounted a hooked latch 32 having an angularly arranged head 33, with a notch 34 in its opposite end, adapted to engage a pointed lug or tooth 35 upon the swinging spindle-carrying arm 14. The latch 32 is provided with an angularly arranged arm $32^{\times}$ normally disposed adjacent the bobbin receiving end of the spindle and adapted to be engaged by the thread for releasing the latch, when the bobbin-winding operation is completed, in a wellknown manner. Encircling stud aperture $31^{\times}$ of the offset portion 30 of the latch carrying lever is an annular chamber 36 for housing a coiled spring, the latter having one end secured in an aperture 37 in said chamber and its opposite end secured in an aperture formed in the bottom of a housing chamber $36^{\times}$ surrounding the fulcrum pin aperture of the latch 32, whereby the latch is spring-pressed toward the tooth or lug 35 of the swinging spindle-carrying arm 14.

The hub 13 of the arm 14 is formed with an annular chamber $13^{\times}$ for housing a coiled spring, one end of the latter being secured in an aperture in the bottom of said chamber and the other end extending outwardly through a lateral opening therein for engagement with the offset portion 30 of the latch carrying lever, whereby the arm 14 is spring-pressed upwardly toward its inoperative position upon release of latch 32.

Encircling the aperture formed in the latch-carrying lever to receive stud 12, is an annular chamber 38 housing a coiled spring 40 one end of which is secured in an aperture formed in said lever and the opposite end is secured in an aperture in the bottom of the housing chamber $38^{\times}$ formed in the belt-guard 9, whereby the latch-carrying lever is spring-pressed to force spindle-carrying arm 14 toward the runway 8 of balance-wheel 6, when the latch carried by said lever is thrown into engagement with the tooth or lug 35 of said arm 14.

In Fig. 1, the parts are shown in the position they assume when the driving-wheel 17 is thrown into engagement with the balance-wheel runway 8. In such position the latch 33 engages lug 35 of spindle-carrying arm 14 thus locking together the said arm and the latch-carrying lever, whereby lever-spring 40 serves to press the rim of the driv-

ing-wheel 17 firmly upon the runway 8 to transmit motion to the bobbin-case 18. As the bobbin-case becomes filled with thread it presses outwardly upon angular arm 32* of latch 32, until, at the completion of the bobbin-winding operation, the detaining lug 35 is released and spring-pressed arm 14 is permitted to spring upwardly until the point of the lug is arrested by engagement with the outer face of the notch 34 of the latch, the parts reaching the position shown in Fig. 3. In such position the driving-wheel 17 is held out of engagement with annular runway 8 of the balance-wheel, and the downward movement of lever 27 under action of spring 40 is prevented by stop-lug 41 formed upon the flange of belt-guard 9.

The parts being in inoperative position, it will be seen by reference to Fig. 3 of the drawings that pressure upon the spindle carrying arm 14 at a point above the spindle 16 will move the arm downwardly against the stress of its spring until the driving-wheel is brought into engagement with the runway 8. During such movement of arm 14 the latch-carrying lever is held against movement by stop-lug 41, and it will be seen that a rubber rim upon the driving-wheel might yield sufficiently to permit latch 32 to lock the driving-wheel in such operative position. In such case, however, the contact between the driving-wheel 17 with runway 8 would be secured solely by virtue of the rubber rim, the action of spring 40 being rendered ineffective by stop-lug 41. To obviate the necessity of using a resilient driving-wheel rim and to transmit the pressure of spring 40 to driving-wheel 17, when the latter is in operative position, the present construction comprises means for locking together the latch-carrying lever and the spindle-carrying arm while the latter is in its upper or inoperative position.

It will be seen from inspection of Fig. 3 of the drawings, in which the driving-wheel is shown in inoperative position, that pressure upon the finger-piece 28 of the lever 27 will cause the offset portion of said lever to rise, the spindle carrying arm 14 likewise rising until lug 42 at the rear of said arm comes into contact with seat 43 on the flange of the belt guard. As the offset portion of lever 27 continues to rise above stop-lug 41, the notched face of latch 32 is carried beyond lug 35 of spindle-carrying arm 14 and, under the action of its spring, the latch is thrown over the upper face of said lug thus locking the arm and the lever together. When the lever finger-piece is released, the action of lever-spring 40 will carry the parts into the operative position shown in Fig. 1.

It will be observed that according to the present improvement the driving wheel for the bobbin-supporting spindle is sustained by the swinging arm supporting said spindle yieldingly in operative relation with the sewing machine balance-wheel which actuates the spindle through said driving wheel, or yieldingly in inoperative relation with said balance-wheel. The spindle driving wheel is thus a floating element when disposed in either its initial retracted position or in its operative position in which latter its resilient mounting enables it to maintain its rolling contact or driving relation with the runway of the balance-wheel.

In my pending application Serial No. 857,291, filed August 18, 1914, the improvement is shown embodied in a device wherein the driving wheel has a resilient connection with the spindle, both of these elements being mounted upon the spring-retracted swinging arm. In either embodiment, however, a resilient connection is provided between the driving wheel and the stud upon which the latch for the swinging arm is mounted, so that, notwithstanding the positive engagement of the latch with the arm carrying the driving wheel, the latter maintains its yielding contact with the runway of the balance-wheel, the face of the driving wheel in each embodiment being substantially inelastic in order that the effectiveness of the rolling contact shall not be dependent upon the elasticity of a substance which deteriorates with age or constant use, such as the rubber ring which has been customarily employed heretofore to provide resiliency in the operative connection between the driving wheel of the bobbin-winder and the sewing machine balance-wheel.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A bobbin-winder comprising a swinging arm, a bobbin-supporting spindle sustained thereby, a spring applied to said arm and adapted to hold it yieldingly in an initial position, a driving wheel having a substantially inelastic face adapted to roll in contact with an actuating element for imparting rotary movements to said spindle, a latch adapted for engagement with said arm to hold it displaced from said initial position, a fulcrum-stud for said latch, and a resilient connection between said stud and the driving wheel whereby the latter is sustained in yielding relation with said stud.

2. A bobbin-winder comprising a swinging arm sustaining a bobbin-supporting spindle and a driving wheel therefor, a swinging lever adjacent said arm, a detachable coupling for connecting said arm and lever to move in unison, a spring applied to said arm for holding it yieldingly in an initial position, and a spring applied to said lever and adapted to act upon said arm through said coupling oppositely to the first-named spring and to overcome the stress of the same for holding said arm in operative

position displaced from said initial position wherein it is adapted to yield bodily.

3. A bobbin-winder comprising a swinging arm, a spindle and a driving wheel therefor carried by said arm, a spring for maintaining said arm in an initial position, a latch-carrying lever, a spring-pressed latch carried by said lever and adapted for engagement with said arm, and a spring applied to said lever and acting in opposition to and adapted to overcome the stress of the first-named spring to yieldingly maintain said swinging arm displaced from its initial position.

4. A bobbin-winder comprising a swinging arm, a spindle and a driving wheel therefor carried by said arm, a spring for maintaining the arm in a given position, a lever spring-pressed in opposition to the spring applied to said arm, means for connecting said lever to the arm whereby the latter is moved in opposition to its spring, and automatically acting means for releasing said arm from the lever at a predetermined period during the action of the bobbin-winder.

5. The combination with a sewing machine frame, a rotary shaft journaled therein and a balance wheel thereon provided with an annular runway, of a bobbin winder comprising a swinging arm, a spindle and a driving wheel therefor carried by said arm, a spring for maintaining the arm in position to hold said driving-wheel out of contact with said runway, a lever spring-pressed in opposition to said arm, means for transmitting the spring pressure of said lever to the arm whereby the latter is moved in opposition to its spring and the driving-wheel is spring-pressed against the runway, and automatically acting means for releasing the pressure of said lever from said arm at the completion of the bobbin-winding operation.

6. The combination with a sewing machine frame, a rotary shaft journaled therein and a balance-wheel thereon provided with an annular runway, of a bobbin-winder provided with a rotary spindle, a friction-wheel mounted on said spindle, a swinging arm carrying said spindle and friction-wheel, a spring for maintaining the arm normally in inoperative position to hold said friction-wheel out of contact with the runway, a latch-lever, a spring for pressing the lever in opposition to the swinging arm, means for limiting the movement of said lever under the pressure of its spring, a latch, means including said latch for locking together the latch-lever and said swinging arm while the latter is in its inoperative position whereby the pressure of said latch-lever spring will carry the driving wheel into spring contact with said runway, and automatically acting means for releasing said swinging arm at the completion of a bobbin winding operation.

7. The combination with a sewing machine frame, a rotary shaft journaled therein and a balance-wheel thereon provided with an annular runway, of a bobbin-winder supported by said frame and provided with a rotary spindle, a friction-wheel mounted on said spindle, a spring-pressed swinging arm adapted to support said spindle and friction-wheel and to maintain the latter normally out of contact with said runway, means for limiting the movement of said arm under its spring, a latch-lever, and a latch adapted to engage said swinging-arm, a spring for pressing said latch-lever in opposition to the swinging arm, a stop for limiting the movement of said lever under its spring, means for moving said lever from the stop to carry said latch into engagement with the swinging arm whereby the pressure of said lever-spring is transmitted to the friction-wheel, and automatically acting means for disengaging the latch from said arm at the completion of a bobbin winding operation.

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

MARTIN HEMLEB.

Witnesses:
W. LEE HELMS,
WM. P. STEWART.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."