W. MILLER.

Bobbin-Winder for Sewing-Machines.

No. 167,111. Patented Aug. 24, 1875.

Fig. 1.

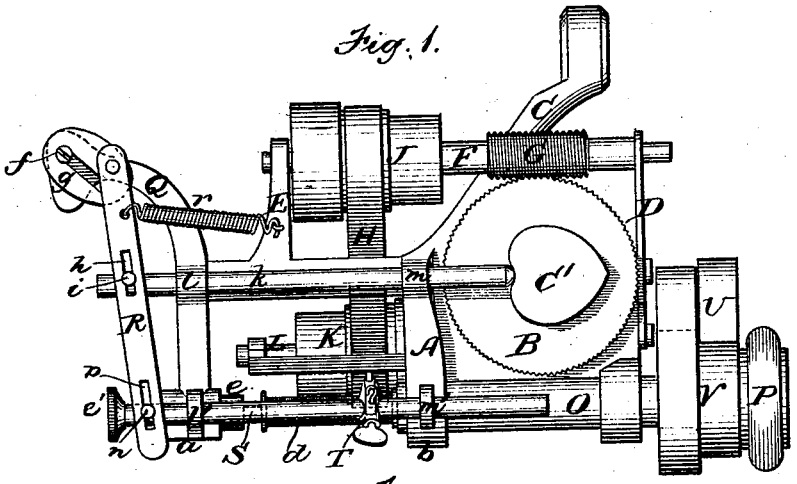


Fig. 2.

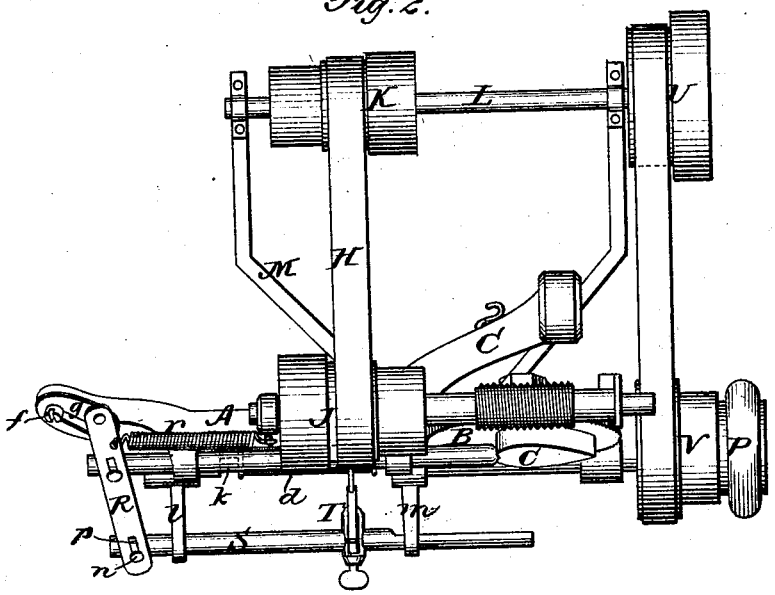
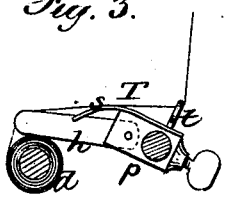


Fig. 3.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM MILLER, OF BOSTON, ASSIGNOR TO HIMSELF AND AUGUSTUS SEAVER, OF MILFORD, MASSACHUSETTS.

IMPROVEMENT IN BOBBIN-WINDERS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **167,111**, dated August 24, 1875; application filed June 8, 1875.

To all whom it may concern:

Be it known that I, WILLIAM MILLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Bobbin-Winders for Sewing-Machines, of which the following is a specification:

In the accompanying drawings forming part of this specification, Figure 1 is a front elevation of my invention. Fig. 2 is a top-plan view, and Fig. 3 a side view, of the thread-guide.

This invention relates to certain new and useful improvements in bobbin-winding attachments for sewing-machines, of the class in which a bobbin-feed or thread-guide is carried back and forth by the side of a revolving bobbin in such manner as to automatically present the thread to the bobbin from end to end.

My invention has for its object, first, to provide simple and effective means for varying the speed of the reciprocating thread-guide to accommodate it to thread, silk, &c., of varying sizes or numbers, so that thread or silk of one size shall be as evenly and compactly wound as another. It also has for its object to adjust the bobbin-feeding mechanism so as to permit the feeding of bobbins of varying lengths and diameters. To these ends my invention consists, first, in providing a bobbin-winding attachment, of the class above named, with a system of differential pulleys arranged between the prime motor and the mechanism that reciprocates the thread-guide, in such manner as to enable the speed of the thread-guide to be increased or diminished according to the size of the thread being wound, thereby insuring the even and compact winding of different sizes of thread. It consists, secondly, in the provision of means for varying the longitudinal motion of the bobbin-feed or thread-guide, so as to accommodate it to bobbins of varying lengths; and it consists, thirdly, in providing the bobbin-feed with a joint and spring, whereby the guide is enabled to bear at all times upon the periphery of the bobbin, whether wound or unwound, without binding, all of which I will now proceed to describe.

In the drawings, A represents the frame of a bobbin-winding attachment, having suitable hangers *a b* and attaching-arm C, and provided with a gear-wheel, B, having on its face a heart-shaped or other cam, C′, as in other devices of this class. D E are uprights, in which is journaled an arbor, F, having a worm-gear, G, which meshes with and operates the gear-wheel, B. J represents a series of differential pulleys connected with the arbor F, and connected by a belt, H, with a series of differential pulleys, K, on an arbor, L, which is journaled in the ends or boxes of a yoke or frame, M, the latter being suitably attached to the lower portion of the frame A. The arbor L carries a series of differential pulleys, U, on its outer end, which are belted to a series of differential driving-pulleys, V, located on the driving-shaft O, which is provided with the usual friction-wheel P, which engages with the operating-wheel of the sewing-machine. The shaft O is journaled in the frame A, and is provided at one end with the usual socket to receive the end of the bobbin *d*, the other end of the bobbin being supported in an adjustable spring-stem, *e*, which is provided with a suitable thumb-knob, *e′*, and allows the ready admission or removal of the bobbin, as heretofore. From the inner end of the frame A extends upward a curved arm, Q, finished with a flattened end or plate, which receives a screw, *f*, which holds a slotted plate, *g*. To the plate *g* is pivoted a connecting-bar or lever, R, formed with a slot, *h*, that receives a stud or pin, *i*, projecting from a sliding bar or rod, *k*, which reciprocates horizontally in a plane passing through the center of the gear-wheel B in bearings *l m* on the side of the frame A, the other end of the bar or rod *k* engaging with the periphery of the cam C′. From the hangers *a b* project bearings *l′ m′*, which support a sliding guide bar or rod, S, provided near its end with a stud or pin, *n*, by which it is connected with the bar or lever R through a slot, *p*, formed in the lower portion of said lever, to whose upper portion is attached one end of a spring, *r*, the other end of which is attached to the frame A, so as to secure the proper tension on the bar *k* and keep it in yielding contact with the cam C′. On the guide rod or bar S is located in such manner as to be adjustable longitudinally, a thread-guide, T, having an eye, *t*, through which the thread

or silk passes to the bobbin, and grooved on the end to properly guide the thread. The guide is provided at the rear with a thumb-screw to hold or release the guide and allow of its adjustment on the rod. Instead of making the guide T in one piece, as heretofore, I make it in two parts, *p h*, the body or rear portion *p* being jointed to the front or movable portion, the top of which is formed to hold one end of a notched spring, *s*, which is connected at the other end with the rear portion *p*.

Any other spring arrangement may be used, if preferred, for keeping the forward end of the guide in yielding contact with the bobbin or the thread thereon, the guide being thus allowed to rise and fall as the material is wound or unwound on or from the spool or bobbin without binding, or otherwise affecting the perfect operation of the thread-guide.

It will be seen that when the attachment is applied to a sewing-machine and the bobbin placed between the spring-stem *e* and the socket of the shaft O, on the application of power the bobbin is revolved by the shaft O, and the gear-wheel B is revolved through the worm G and pulleys J K U V. The rotation of the wheel B and its cam C produce the reciprocating motion of the thread-guide T, through the bar *k*, connecting bar or lever R, and bar S, the bars *k* S sliding in their bearings, and *k* being caused by the spring *r* to follow the eccentric periphery of the cam C as it revolves. The guide is thus caused to reciprocate in a path parallel with the bobbin, delivering the thread to the latter from end to end.

When the coarsest thread is being wound the differential pulleys J K U V are so connected as to increase the speed of the rotation of the wheel B, and the consequent reciprocation of the thread-guide T to the maximum, thus causing the guide to travel from end to end of the bobbin comparatively rapidly.

When the finest thread is being wound the speed of the thread-guide is reduced to the minimum, and thus the compact and uniform winding of different sizes of thread is secured.

Any desired number of differential pulleys may be employed, and they may be marked to designate those that are to be belted together to properly wind thread of a certain size or number.

By raising or lowering the pivotal point or fulcrum of the connecting bar or lever R by means of the slotted plate *g*, the length of throw or stroke of the thread-guide T is adjusted, the throw being lengthened when the fulcrum is raised and the lever lengthened between its fulcrum and the bar *k*, and vice versa. By this means the guide T is enabled to feed bobbins of different lengths.

The frame A may be shaped in any desired manner to be conveniently attached to sewing-machines of different construction, and the attachment may be applied to a sewing-machine by means of a screw through the connecting-arm C, as heretofore, or by any suitable means.

I claim as my invention—

1. In a sewing-machine bobbin-winding attachment, the combination of the driving-shaft O, having the friction-wheel P and differential pulleys V, the intermediate arbor L, having two sets of differential pulleys, K U, the arbor F, having the differential pulleys J and worm-gear G, and the gear-wheel B having the cam C′, all located in a suitable frame, connected and arranged as set forth, and adapted to rotate the cam C at different rates of speed, substantially as and for the purpose specified.

2. The reciprocating thread-guide T, in combination with the sliding bars S *k*, connecting bar or lever R, spring *r*, fulcrum-plate *g*, and cam C′, substantially as and for the purpose specified.

3. The thread-guide T, composed of the two parts *p h*, jointed or hinged together and provided with the spring *s* and eye *t*, substantially as and for the purpose specified.

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

WILLIAM MILLER.

Witnesses:

SAML. M. BARTON,

C. F. BROWN.