

(No Model.)

E. B. WELCH.

THREAD FEEDING MECHANISM FOR SEWING MACHINES.

No. 434,009.

Patented Aug. 12, 1890.

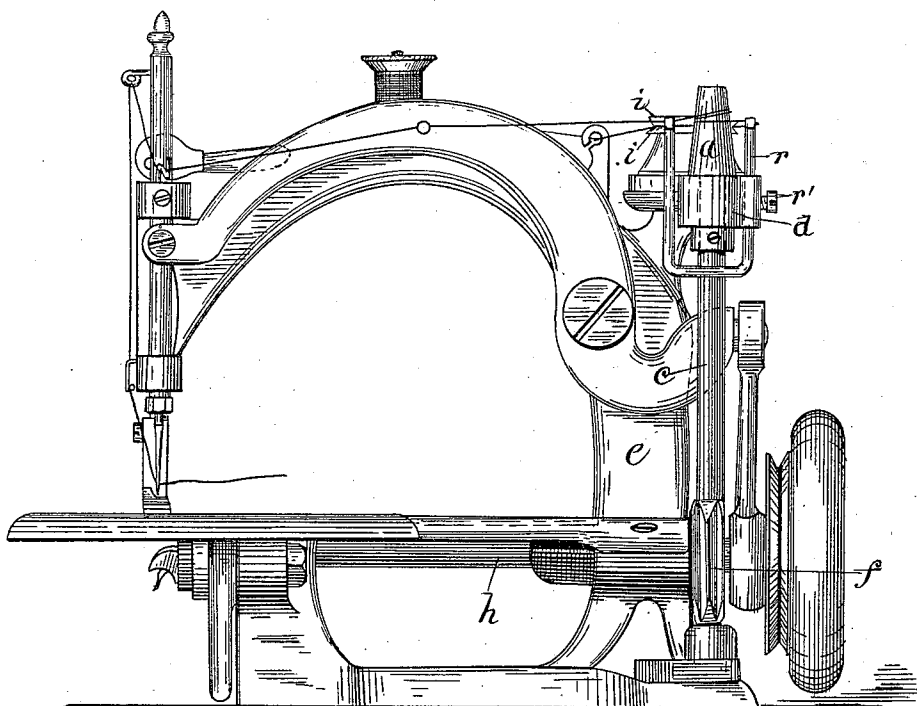


Fig. 1.

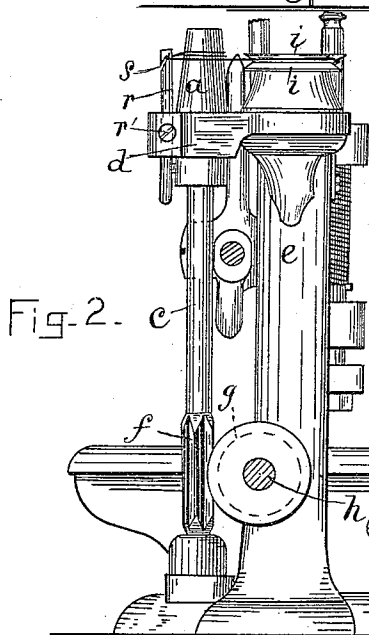


Fig. 2.

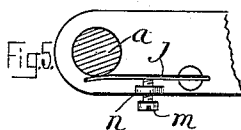


Fig. 5.

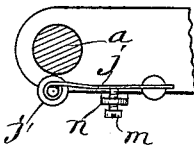


Fig. 6.

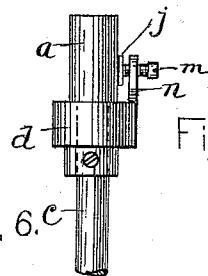


Fig. 3.

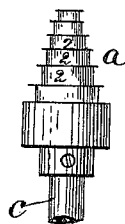


Fig. 4.

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EBENEZER BAKER WELCH, OF CAMBRIDGE, MASSACHUSETTS.

THREAD-FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 434,009, dated August 12, 1890.

Application filed October 10, 1884. Renewed March 22, 1886. Again renewed February 11, 1888. Serial No. 263,660. (No model.)

To all whom it may concern:

Be it known that I, EBENEZER BAKER WELCH, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Thread-Feeding Mechanisms for Sewing-Machines, of which the following is a specification.

This invention has for its object to provide means for automatically pulling thread from the supplying bobbin or spool of a sewing-machine and feeding it forward to the stitch-forming mechanism at a rate directly proportioned to and governed by the speed of the machine.

Two thread-feeding rolls have been made which are positively rotated by the power that drives the machine and at a rate directly proportioned to the rapidity with which the machine operates, the thread passing between said rolls and being grasped and fed forward thereby.

The present invention consists in a single feeding-roll rotated by the power that drives the machine, combined with means for keeping the thread in frictional contact with the feeding-roll, whereby the rotation of the roll is caused to feed the thread forward, all of which I will now proceed to describe.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a side view of a Wilcox & Gibbs sewing-machine provided with my improvement. Fig. 2 represents a rear elevation of the same. Figs. 3, 4, 5, and 6 represent modifications.

The same letters of reference indicate the same parts in all of the figures.

In the drawings, *a* represents the single feed-roll, located in any suitable or convenient relation to the bobbin or spool which supplies thread to the needle. The roll *a* is affixed to a vertical arbor *c*, which is journaled near the upper end in a bearing in a projection *d* on the arm *e* of the machine, while the lower end of said arbor is journaled in a step formed on the frame of the machine. The arbor *c* is provided with a pinion *f*, meshing with a worm-wheel *g* on the driving-shaft *h* of the machine. The arbor *c* and its roll are thus positively rotated at a rate of speed corresponding to the rate of rotation of the driving-shaft.

The thread from the supplying spool or bobbin is so engaged with the roll *a* that the rotation of the latter will pull the thread steadily from the bobbin and allow it to pass to the stitch-forming mechanism at a fixed rate, corresponding to the rate of operation of said mechanism, so that the tension of the thread between the feeding-roll and the needle will always be substantially uniform.

In Figs. 3 and 5 I have shown a spring *j* arranged to keep the thread operatively engaged with the roll *a*, said spring bearing with a yielding pressure against the roll *a* and against the thread that is in contact with the roll, thus keeping the thread in frictional contact with the roll.

Fig. 6 shows the spring *j* as provided at its outer end with an idle-roll *j'*, which is pressed by the spring against the thread on the roll *a*. Said idle-roll may be of rigid or yielding material. The pressure of the spring against the thread may be regulated by means of a screw *m*, working in a lug *n* and bearing against the spring.

The thread-feeding roll may be tapering or frusto-conical in form, in which an adjustable guide *r* may be employed to keep the thread upon larger or smaller portions of the varying diameter of the roll, and thus cause it to be fed more or less rapidly. The guide *r* is composed of connected arms having eyes *s* near their ends. One of said arms passes through a socket in a support *d*, and is secured at any point to which it may be adjusted by a set-screw *r'*.

Fig. 4 shows the roll made in sections 2 2 2, each of a different diameter from the others. The sections are preferably provided with flanges, as shown, to keep the thread in place on the sections. If preferred, however, the flanges may be omitted, particularly when the thread-guiding device is used.

I do not limit myself to a roll with a varying diameter. Fig. 3 shows a straight roll or cylinder, which may be employed instead of the forms above described. The roll *a* when made in a single piece may also be detachable from the arbor, so that different sizes can be used interchangeably.

It will be seen that the single roll with the co-operating device constitutes a simple and

efficient means for supplying thread to the needle at a predetermined rate.

I claim—

- 5 1. In combination with the driving mechanism of a sewing-machine, a single-thread feeding-roll driven thereby, and adjustable thread-guides, substantially as described, whereby the thread is kept in operative relation to the feed-roll, as set forth.
- 10 2. In combination with the driving mechanism of a sewing-machine, a thread-feeding roll driven thereby, and a spring attached at one end to a fixed support and arranged to bear against the periphery of said roll and to exert pressure on a thread interposed between it and the roll, as set forth, whereby the thread is kept in operative relation to the feeding-roll.
- 15 3. In combination with the driving mech-

anism of a sewing-machine, an arbor driven thereby, having a thread-feeding roll composed of a series of sections of different diameters arranged in different planes, as set forth.

4. In combination with the driving mechanism of a sewing-machine, a thread-feeding roll composed of sections of different diameters, and thread-supporting flanges between the sections, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of October, 1884.

EBENEZER BAKER WELCH.

Witnesses:

C. F. BROWN,
H. BROWN.