June 6, 1933. F. F. ZEIER ET AL 1,912,959

LOOPER MECHANISM FOR SEWING MACHINES

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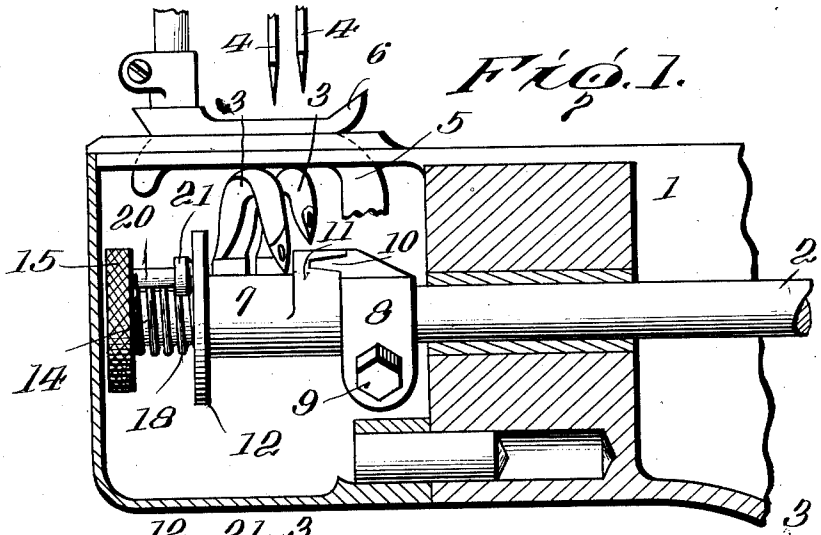


FIG. 1.

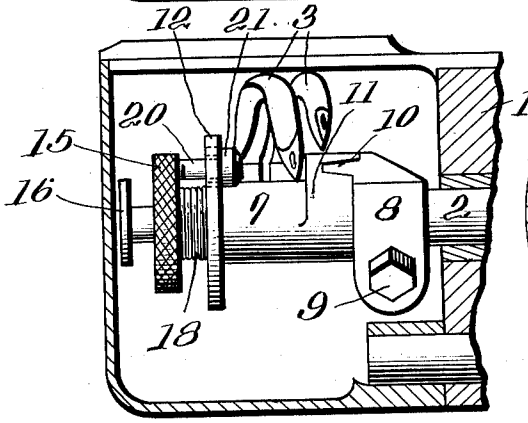


FIG. 3.

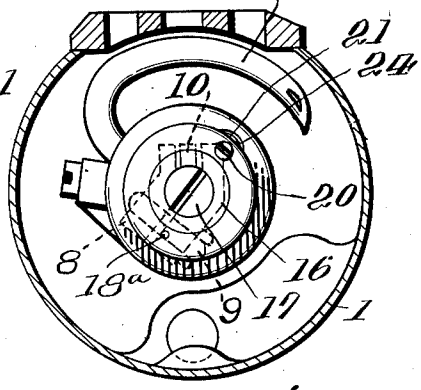


FIG. 2.

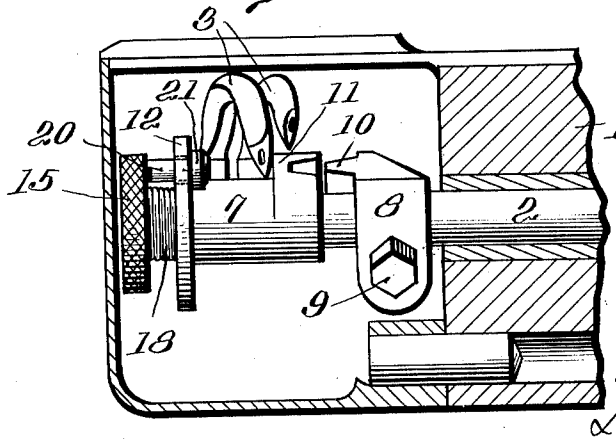


FIG. 4.

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LOOPER MECHANISM FOR SEWING MACHINES

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Fig. 5.

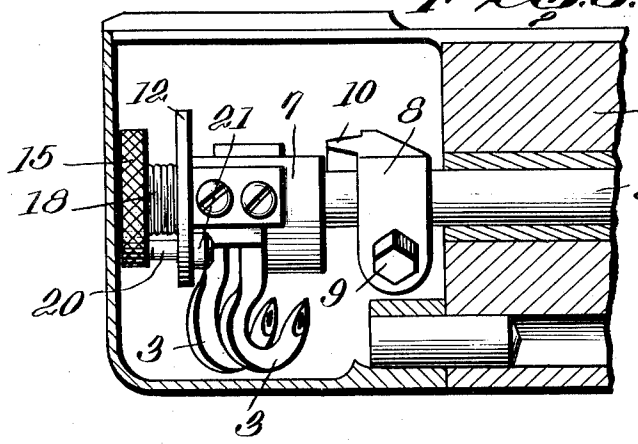


Fig. 9.

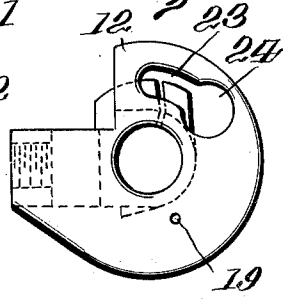


Fig. 6.

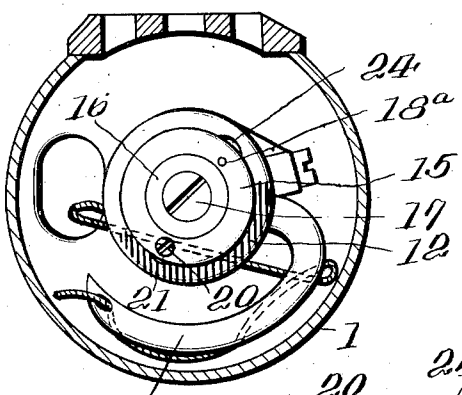
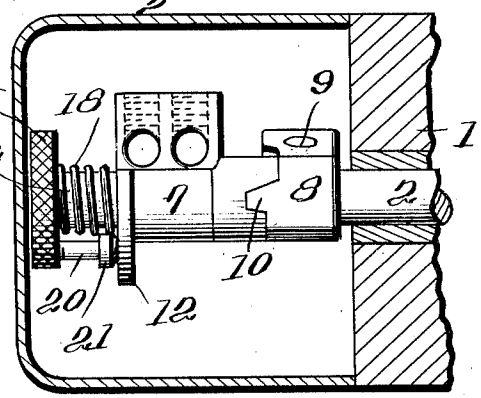


Fig. 8.



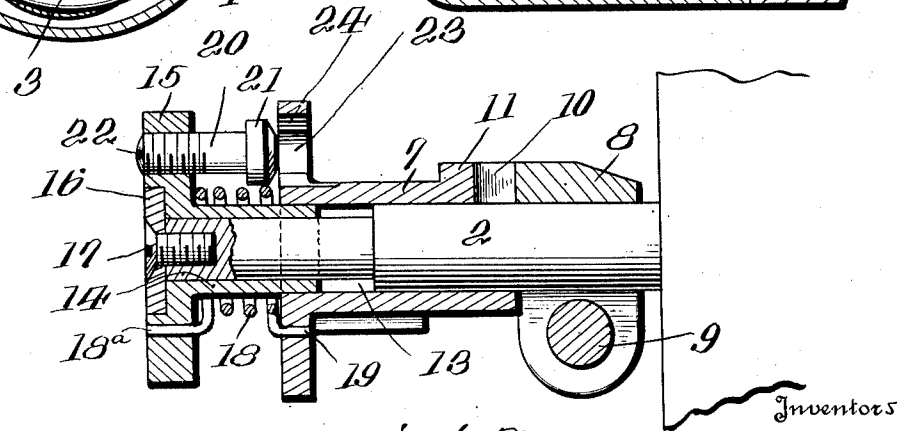


Fig. 7.

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UNITED STATES PATENT OFFICE

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LOOPER MECHANISM FOR SEWING MACHINES

Application filed September 8, 1930. Serial No. 480,581.

The invention relates to new and useful improvements in a looper mechanism for sewing machines, and more particularly to the means for supporting the looper, whereby it may be moved to a position where it is readily accessible for threading.

An object of the invention is to provide a looper supporting means wherein the looper is locked to the looper operating shaft by a yielding means which can be rendered ineffective for permitting the looper to be disconnected and turned to a position where it is readily accessible for threading.

A further object of the invention is to provide a looper supporting means of the above type which may be used in a work supporting arm.

A still further object of the invention is to provide a looper supporting means of the above type wherein the looper may be shifted both axially and circumferentially of the looper supporting shaft.

These and other objects will, in part, be obvious and will, in part, be hereinafter more fully disclosed.

In the drawings, which show by way of illustration one embodiment of the invention:—

Fig. 1 is a vertical sectional view through the end of a work supporting arm showing the looper supporting means embodying the invention.

Fig. 2 is an end view of the work supporting arm with the end cap removed.

Fig. 3 is a view of the looper supporting means showing the yielding means as rendered ineffective so that the looper may be disconnected from its holding means.

Fig. 4 is a view similar to Fig. 3 but showing the looper support as shifted endwise of the shaft for releasing it from its holding means.

Fig. 5 is a view similar to Fig. 4 but showing the loopers as turned to a position where they are rendered accessible for threading.

Fig. 6 is a view partly in section and partly in elevation showing the parts as positioned in Fig. 5.

Fig. 7 is an enlarged detail showing the looper supporting means in section.

Fig. 8 is a plan view of the looper support and holding means therefor.

Fig. 9 is an end view of the looper support.

The invention is directed to a looper supporting means which is especially adapted for use in connection with a sewing machine having a work supporting arm, onto which or off from which the material is fed during stitching. In this type of machine the looper operating shaft extends longitudinally of the work supporting arm and the loopers are mounted on the end of this shaft. The shaft is oscillated and moved endwise for giving to the loopers their loop taking movements and also their needle avoiding movements. In order to facilitate threading of the loopers, the carrier or means for supporting the looper is mounted on the looper supporting shaft so that it is free of the shaft. Means is provided for locking this looper support to the shaft which includes cooperating interlocking parts and yielding means for holding these parts in their interlocked position. Manual means is provided for rendering the yielding means ineffective so that the looper support can be readily moved endwise of the shaft for releasing the same from its holding means and then said support is free to be turned on the shaft to position the loopers where they may be readily accessible for threading.

Referring more in detail to the drawings, the invention as shown is applied to a sewing machine having a work supporting arm 1 in which is mounted a looper operating shaft 2, carrying as shown in the drawings two loopers 3. It will be understood, of course, that one looper may be used instead of two. Associated with each looper is a needle 4 and the needles and loopers associated therewith form independent lines of stitching. The material is fed along the work support by a feed log 5 and is held on the work support by a presser foot 6. These parts are of the usual construction in a feed off the arm sewing machine and further description thereof is not thought necessary. The looper shaft is given an endwise motion for imparting to the loopers a needle avoiding motion. It is

given an oscillating motion for causing the loopers to enter the needle thread loops.

The present invention is directed particularly to the means for supporting the loopers. The loopers are mounted on a loop carrier or support 7, which is cylindrical and which is mounted on the looper shaft 2 freely, that is, it is free to turn or move endwise on the shaft, so far as the direct connection between this looper support and the shaft is concerned. The loopers 3, 3, are mounted in this looper carrier or support 7 in the usual way. Clamped to the looper shaft 2, is a collar 8, said collar is secured to the shaft by means of a clamping bolt 9. This collar 8 can be set in any desired position on the shaft. It can be shifted endwise of the shaft or turned on the shaft or secured in its set position. Projecting laterally from this collar 8 is a tongue or rib 10. The looper support 7 is provided with an arm 11, which has formed therein a radial groove or recess adapted to receive the rib 10. This rib is of considerable length so that when it is placed in the recess, which it fits snugly, it will hold the looper support from any circumferential movement on the shaft 2. When the parts are in the position shown in Figs. 1 and 3, the looper support will be held from any circular movement on the shaft 2 and will be positively oscillated by the oscillations imparted to the shaft 2.

On the end of the looper support 7, there is a flange or disc 12. The looper shaft 2 at its end is reduced in diameter forming a recess 13 between the looper support and this reduced portion of the shaft 3. A sleeve 14 is mounted on the reduced portion of the shaft and extends into this recess. This sleeve is provided with an enlarged disc shaped head 15. On the end of the shaft is a washer 16, which is secured thereto by a screw 17. A spring 18 encircles the sleeve 14. One end of this spring extends through an opening 18*a* in the head 15 carried by the sleeve and the other end extends through an opening 19 in the flange or disc 12 carried by the looper support. The spring is placed under tension so that it tends to separate the head 15 and the flange 12, thus forcing the looper support toward the holding collar and thus forcibly holding the rib in the recess which locks the looper support to the holding collar. Mounted in the head 15, is a stud 20, provided with a disc shaped head 21 at the outer end thereof and a slot 22 at the inner end, whereby said stud may be turned for adjustment in the supporting head 15 carried by the sleeve 14. In the flange 12 is a slot 23 which is arcuate and concentric with the center of the looper operating shaft. This slot has an enlarged opening 24 at one end thereof which is adapted to receive the head 21 of the stud 20. The disc 15 is knurled as shown in the drawings. When the parts are in the position shown in Fig. 1, the spring is pressing the looper support endwise on the looper operating shaft and the rib 10 is firmly seated in the recess in the arm 11. Thus it is that the spring holds the looper support from endwise movement on the shaft and the rib holds the looper support from circular movement on the shaft and the loopers will be oscillated with the shaft and move laterally when the shaft is moved endwise. When it is desired to release the loopers for moving the same into position for threading, the knurled head 15 is turned so as to bring the head of the stud in alignment with the enlarged opening 24 at the end of the arcuate slot 23. The sleeve is then moved endwise on the shaft and the head of the stud passed through this opening 24. After it is all the way through the opening, the knurled part is turned by hand and through the aid of the spring so as to move the stud along the arcuate slot. The spring will hold the stud at the left hand end of the slot as viewed in Fig. 9. The head 21 overlies the sides of the slot and this prevents the spring from separating the flange 12 and the head 15. The spring is now held compressed and ineffective to force the looper support endwise on the shaft. The looper support and the flanged head which is locked thereto may then be moved endwise of the shaft until the looper support is released from the holding collar after after which the looper support and flanged head may be turned as a unit to position the loopers where they may be readily accessible for threading. When it is desired to turn the loopers to their locked position on the shaft, the unit is turned manually until the recess in the looper support is in alignment with the rib 10 and the support is moved endwise until these parts are inter-locked after which the knurled head can be turned in a clock-wise direction until the stud head is opposite the opening 24 and then the stud will be released from the flanged end of the looper support and this will move the head 15 outward until it contacts with the washer 16.

From the above it will be apparent that a very simple means has been provided whereby the looper is firmly held secured to the looper supporting shaft and by a hand manipulated device it can be quickly released and turned on the shaft to a position for threading. There is no latch to work loose and release the looper; it is held interlocked with its holding means by the action of the spring 18. The spring may possibly be said to be latched in ineffective position but this only occurs when the looper support is to be released from its holding means and when the machine is stopped.

It is obvious that minor changes in the details of construction may be made without departing from the spirit of the invention,

as set forth in the appended claims. It will also be obvious that this looper releasing means may be used with other types of sewing machines than the one illustrated.

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

1. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on said shaft, loopers carried thereby, holding means for securing the looper support from circular movement on said shaft and yielding means for moving the looper support on the shaft into locking engagement with the holding means.

2. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on said shaft, loopers carried thereby, holding means for securing the looper support from circular movement on said shaft, yielding means for moving the looper support on the shaft into locking engagement with the holding means, and means for rendering said yielding means ineffective whereby said looper support may be freed from its holding means.

3. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on said shaft, a holding collar fixed to said shaft, means whereby said looper support may be connected to and disconnected from said holding collar and means whereby said holding collar may be shifted endwise of the shaft and circularly on said shaft to different set positions.

4. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on said shaft, a holding collar fixed to said shaft, means whereby said looper support may be connected to and disconnected from said holding collar and means whereby said holding collar may be shifted endwise of the shaft and circularly on said shaft to different set positions, said means for connecting the looper support to and disconnecting said looper support from the holding collar including a spring and manual means for rendering said spring ineffective.

5. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on said shaft, a holding collar fixed to the shaft, said collar and support having an interlocking rib and groove connection for preventing said looper support from circular movement on said shaft and a spring for moving said looper support lengthwise of the shaft and for causing the rib to engage the groove.

6. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on the said shaft, a holding collar fixed to the shaft and located at one end of said support, said collar and support having interlocking parts for preventing the looper support from turning on the shaft, a spring engaging the other end of said looper support and yieldingly holding said support with said parts in engagement.

7. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on the said shaft, a holding collar fixed to the shaft and located at one end of said support, said collar and support having interlocking parts for preventing the looper support from turning on the shaft, a spring engaging the other end of said looper support and yieldingly holding said support with said parts in engagement, and means whereby said spring may be rendered ineffective so that said looper support may be moved endwise on the shaft and the interlocking parts released.

8. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on the said shaft, a holding collar fixed to the shaft and located at one end of said support, said collar and support having interlocking parts for preventing the looper support from turning on the shaft, a spring engaging the other end of said looper support and yieldingly holding said support with said parts in engagement, a sleeve on said shaft against which said spring abuts, and a washer on said shaft for limiting the movement of the sleeve away from said collar.

9. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on the said shaft, a holding collar fixed to the shaft and located at one end of said support, said collar and support having interlocking parts for preventing the looper support from turning on the shaft, a spring engaging the other end of said looper support and yieldingly holding said support with said parts in engagement, a sleeve on said shaft against which said spring abuts, and a washer on said shaft for limiting the movement of the sleeve away from said collar, and means whereby said sleeve may be connected to said looper support and the spring held ineffective so that said sleeve spring and support may be shifted endwise and turned as a unit for placing the loopers for threading.

10. A looper mechanism for sewing machines comprising an operating shaft, a looper support freely mounted on the said shaft, a holding collar fixed to the shaft and located at one end of said support, said collar and support having interlocking parts for preventing the looper support from turning on the shaft, a spring engaging the other end of said looper support and yieldingly holding said support with said parts in engagement, a sleeve on said shaft against which said spring abuts, and a washer on said shaft for

limiting the movement of the sleeve away from said collar, a headed stud carried by said sleeve, said looper support having a flange provided with an arcuate slot enlarged at one end to receive said headed stud, the head of said stud overlying the sides of said slot, said stud being so proportioned that when attached to said flange it will hold the spring compressed and permit said sleeve, spring and support to be moved endwise and turned on the looper shaft for placing the looper for threading.

In testimony whereof, we affix our signatures.

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