

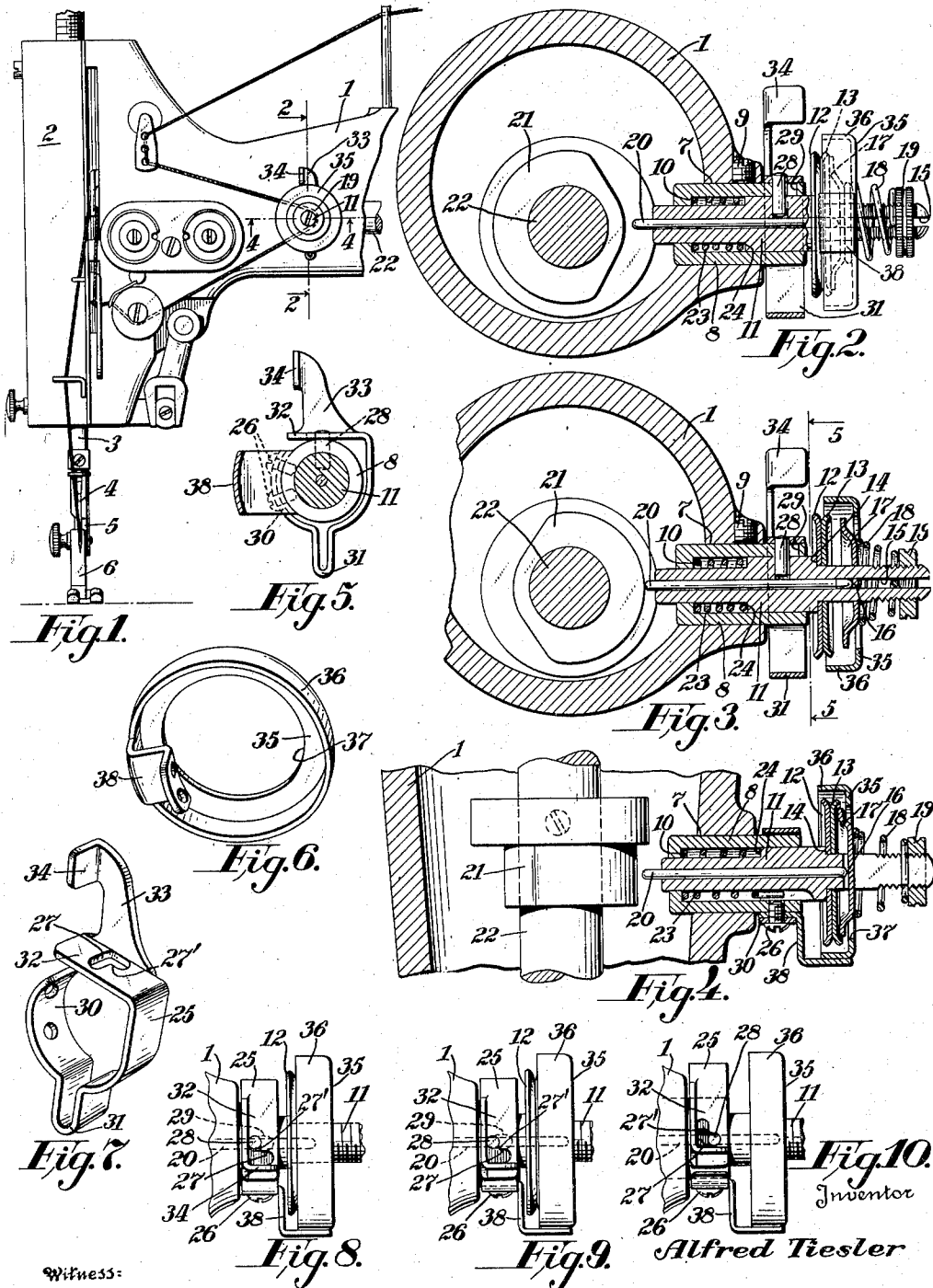
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INTERMITTENT TENSION DEVICE

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INTERMITTENT TENSION DEVICE

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This invention relates to sewing machines and more particularly to thread-tension mechanisms of the intermittent type used on various kinds of these machines.

Sewing machines adapted for general tailoring must necessarily be equipped to perform a wide variety of sewing operations, such as darning, hemming, button-holding, button-sewing, thread-markings, etc. In order that the machine may be adapted to perform expeditiously all these sewing operations, it must be equipped with a considerable number of devices, each adapted to assist the operator in performing the required operation.

The present invention has to do with an intermittent tension device, the function of which is to assist the machine in performing the so-called "thread-marking" operation, i. e., the basting together of two plies of fabric along chalk-lines drawn according to a pattern and subsequently cutting the basting stitches between the two fabric-ply, whereby two symmetrically thread-marked fabric-sections are obtained. In performing the thread-marking operations, during which the lower-thread bobbin has been removed from the bobbin-case, it is desirable that the stitches be made very long. In the production of long stitches with a sewing machine, it is preferable that the customary tension on the needle-thread be removed during that time in which the fabric is being fed past the stitch-forming mechanism, thereby to eliminate puckering of the fabric between the stitches. For this reason the tension device used for this operation is preferably of the intermittent type which is so actuated as to open up and thereby relieve the needle-thread of tension during the feeding stroke.

In addition to the intermittent tension, the machine must also be fitted with the usual constant-tension device which is used during normal straightaway stitching and other sewing operations. The presence of several different types of tension devices on a single machine is quite confusing to the less experienced operator, and it is desirable that some means be provided which will assist the operator in selecting and properly using the particular tension device for the sewing operation at hand.

Therefore, the primary object of the present invention is the provision of means designed to preclude the use of a particular tension device for any other operation than that for which it is intended.

Another object of the improvement is to pro-

vide a tension device which may be easily and quickly rendered operative or inoperative.

A further object of the invention is the provision of improved means for maintaining a sewing machine tension device in either operative or retracted position.

Other advantages and beneficial results in operation will be apparent from the following description of an illustrative embodiment of my invention taken in connection with the accompanying drawing in which:

Fig. 1 is a front elevation, on reduced scale, of a portion of the bracket-arm of a sewing machine fitted with the improved tension device, illustrating the preferred arrangement of the usual constant-tension devices and the improved intermittent-tension device.

Fig. 2 represents a vertical section taken substantially along the line 2—2, Fig. 1, illustrating upon a larger scale the tension device in normal operating position with the tension disks arranged to engage and apply tension to the thread passing therebetween.

Fig. 3 represents a view similar to Fig. 2, showing the tension device in normal operative position, but with the tension disks relieved of spring pressure so that the thread may pass therebetween without having tension applied thereto.

Fig. 4 is a horizontal section taken substantially along the line 4—4, Fig. 1, illustrating upon a larger scale the tension device in retracted position with the two tension disks disposed within the guard member, whereby they are rendered inaccessible for threading.

Fig. 5 is a sectional view taken substantially along the line 5—5, Fig. 3, showing the way in which the spring-latch member and the guard are mounted upon the tension device.

Fig. 6 is a perspective view of the guard member for the tension disks.

Fig. 7 is a perspective view of the spring-latch member.

Figs. 8, 9 and 10 are fragmentary elevational views of Figs. 2, 3 and 4, respectively, illustrating the improved spring-latch means used for holding the tension device in either operative or retracted position.

Referring to the drawing, that portion of the sewing machine shown comprises a bracket-arm terminating in a head in which are journaled for endwise reciprocation the usual needle-bar carrying needle, and the presser-bar carrying presser-foot. The bracket-arm is formed with an aperture receiving the hollow cylin-

drical shank 8 of the tension device, which shank is engaged by the inner end of the set-screw 9 which fixes the tension device in working position upon the sewing machine.

5 The shank 8 is provided with an end-wall 10 having formed therein a centrally located aperture through which passes the reduced inner end of a hollow stem 11, which stem is free to slide endwise and also turn, for a limited extent, in the shank 8. Surrounding the hollow stem 11 are opposed thread-engaging means in the form of tension disks 12 and 13, of which the disk 12 rests against a shoulder 14 formed on the stem 11. The outer end-portion of the stem 11 is provided with a longitudinal diametrical slot 15 through which passes the diameter-bar 16 crossing the central stem-embracing aperture in the tension-releasing cup 17 which is normally pressed against the tension disk 13 by the bee-hive spring 18. To provide for adjusting the amount of tension applied to the needle-thread, the outer end of the bee-hive spring 18 is engaged by a knurled thumb-nut 19 threaded upon the outer end-portion of the stem 11.

25 In order that the tension disks 12 and 13 may be intermittently opened to release the thread, there is disposed within the hollow stem 11 the usual tension-release pin 20 which engages the diameter-bar 16 of the cup 17 and relieves the tension disks of the pressure of the spring 18 when the tension-release pin 20 is moved endwise by the cam 21 secured upon the upper main-shaft 22 (see Fig. 3).

35 It will be observed, by reference to Figs. 2 and 4, that the stem 11, together with the elements carried thereby, may be shifted endwise away from the cam 21 and into retracted position by a coil-spring 23 surrounding the inner end-portion of the stem 11 and acting between the end-wall 10 of the shank 8 and a shoulder 24 formed on the stem 11. The means employed for holding the tension device in either operative or retracted position comprises a spring-latch member 25 secured upon the shank 8 by screws 26 and having formed therein an L-shaped slot 27 entered by a laterally projecting stop-pin 28 on the stem 11. The L-shaped slot 27 is so formed in the spring-latch member 25 that one limb thereof extends in a direction substantially parallel to the longitudinal axis of the stem 11, while the other limb thereof extends transversely of the longitudinal axis of the stem 11. The stop-pin 28 extends through an elongated aperture 29 in the shank 8, the ends of the aperture 29 providing stops for limiting the endwise movement of the stem 11.

55 As clearly illustrated in Figs. 5 and 7, the spring-latch member 25 is formed with a curved apertured end-portion 30 for attachment upon the shank 8, a looped portion 31 to give to the latch-member the necessary resiliency, a substantially straight portion 32 in which is formed the L-shaped slot 27, and a lateral projection 33 offset at 34 to provide a manually controlled release-lever.

65 Referring now to Figs. 2 and 8, it will be understood that the tension device is held in operative position by the spring-latch member 25 through the medium of the stop-pin 28 and the transverse limb of the L-shaped slot 27. In the operative position of the tension device the coil-spring 23 is compressed, thereby maintaining the stop-pin 28 in engagement with one side-wall 27' of the L-shaped slot in the spring-latch member 25.

75 The looped portion 31 of the latch member 25

urges the end-portion 32 of the latter in counter-clockwise direction and this action, together with the pressure exerted by the coil-spring 23, holds the stop-pin 28 seated in the transverse limb of the L-shaped slot 27 in the latch member 25, see Fig. 8.

To permit the tension device to be shifted into retracted position, the position illustrated in Figs. 4 and 10, it is only necessary for the release-lever 34 of the latch member 25 to be manually shifted. This movement of the release-lever moves it relatively to the stop-pin 28, shifting the side wall 27' of the L-shaped slot in the latch member 25 out of engagement with the stop-pin 28, when the tension device, under the action of coil-spring 23, moves to a position determined by the end of the elongated aperture 29 in the shank 8. In retracted position, the tension-release pin 20 is out of the range of action of the cam 21 and is therefore not moved endwise thereby.

To restore the tension device to operative position, it is merely necessary that axial pressure be applied to the outer end of the stem 11, thereby compressing the spring 23 and shifting the stop-pin 28 along the parallel limb of the L-shaped slot 27 into register with the transverse limb of said slot, when the spring-latch member 25 will spring back into normal locking position, thereby shifting the side wall 27' into engagement with the stop-pin 28.

From the above description, it will be understood that in order to render the tension device inoperative it is only necessary to shift the release-lever 34 manually, and to render the tension device operative it is only required to apply a small axial pressure upon the outer end of the stem 11.

To guard against threading the tension device when it is in retracted or inoperative position, there is mounted, preferably upon the shank 8, a sheet-metal ring-like guard member 35 formed with a laterally extending peripheral flange 36 and a clearance aperture 37, through which extends the tension-releasing cup 17. Formed integral with the flange or otherwise attached thereto is a supporting bracket 38, the free end of which is secured by screws 26 upon the shank 8 directly beneath the curved end 30 of the latch member 25 (Fig. 4). It will be observed from Fig. 4 that the guard member is disposed so as to enclose the tension disks 12 and 13 when the tension device is in retracted position, thereby effectively precluding the threading of the tension device. However, when the tension device is in operative position, see Figs. 2 and 3, the tension disk 12 is positioned substantially entirely outside of the confines of the guard member 35 in which position of the tension disk 12 the thread may be conveniently introduced between the tension disks.

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

1. In a sewing machine tension device having an operative and a retracted position, a stem, thread-engaging means mounted on said stem, a tension-spring acting upon said thread-engaging means, and a guard member adapted to preclude the insertion of thread into said thread-engaging means when the tension device is in retracted position.

2. In a sewing machine tension device having an operative and a retracted position, a stem, thread-engaging means carried by said stem, a tension-spring yieldingly maintaining the thread-

engaging means in contact with the thread passing therethrough, and a guard member comprising a ring-like element having a peripheral flange adapted to enclose said thread-engaging means when the tension device is in retracted position.

3. In a sewing machine tension device having an operative and a retracted position, a stationary shank, a stem mounted in said shank for movement relative thereto, thread-engaging

means carried by said stem, a tension-spring acting upon said thread-engaging means, and a guard member fixed upon said shank and adapted to preclude the threading of the tension device when the latter is in retracted position.

4. In a sewing machine tension device having an operative and a retracted position, a shank, a stem mounted in said shank, thread-engaging means carried by said stem, a tension-spring acting upon said thread-engaging means, and a guard member adapted to preclude the threading of the tension device when the latter is in retracted position, said guard member comprising a ring-like element formed with a laterally projecting peripheral flange adapted to enclose said thread-engaging means when the tension device is in retracted position, and a bracket secured to the shank for supporting said guard member.

5. A thread-tension device for sewing machines comprising a stem having a plurality of predetermined positions, thread-engaging means carried by said stem, a tension-spring acting upon said thread-engaging means, means for maintaining said stem in any of its predetermined positions, and a guard member adapted to preclude the insertion of thread into said thread-

engaging means when the stem is in one of its predetermined positions.

6. In a sewing machine tension device having an operative and a retracted position, a stem, tension-disks mounted upon said stem, a tension-spring acting upon said tension-disks, and a guard member into which said tension-disks move when the tension device is shifted into retracted position.

7. In a sewing machine tension device, a stem having a plurality of predetermined positions, thread-engaging means carried by said stem, a tension-spring acting upon said thread-engaging means, and means for locking said stem in one of its predetermined positions, said means including a spring-latch member having formed therein an aperture providing a stop, and a pin mounted in said stem and entering said aperture for cooperation with said stop.

8. In a sewing machine, the combination, with a rotary shaft having a cam thereon, of an intermittent tension device having an operative and a retracted position, said tension device comprising a shank, a stem mounted for limited endwise movement in said shank, thread-engaging means carried on said stem, a tension-spring acting upon said thread-engaging means, a tension-release pin intermittently engaged by said cam when the tension device is in operative position for relieving the thread-engaging means of the pressure of said tension-spring, and means including a spring-latch member for maintaining the tension device in retracted position with said tension-release pin out of effective cooperation with said cam.

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