

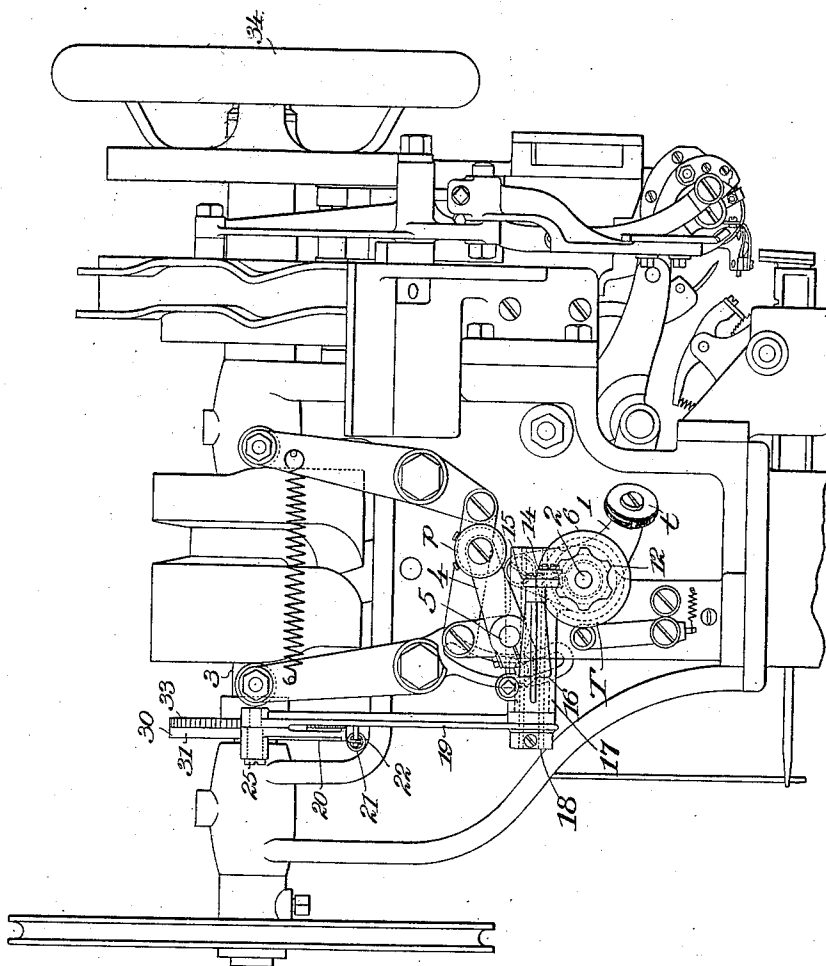
A. EPPLER.
TENSION RELEASING DEVICE.
APPLICATION FILED MAR. 16, 1903.

1,011,177.

Patented Dec. 12, 1911.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:
John F. C. Printz
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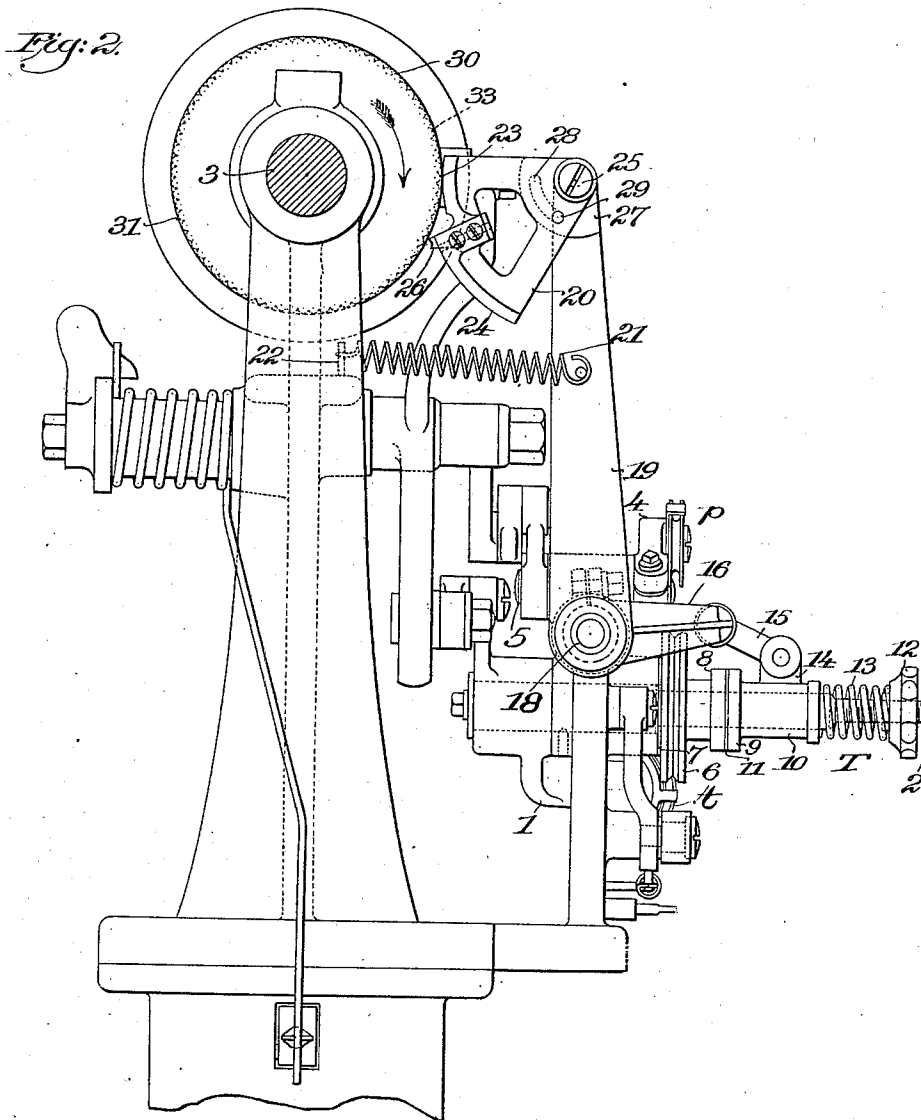
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Andrew Eppler
By his Attorneys
Phillips Van Curen & Fish

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Witnesses:
Alfred H. Hilgert
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Inventor:
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UNITED STATES PATENT OFFICE.

ANDREW EPPLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TENSION-RELEASING DEVICE.

1,011,177.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed March 16, 1903. Serial No. 147,880.

To all whom it may concern:

Be it known that I, ANDREW EPPLER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Tension-Releasing Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to an improvement in tension releasing devices for sewing machines.

The object of the present invention is to reorganize and improve devices of this character, and to this end the invention consists in the tension releasing device hereinafter described and claimed.

In the accompanying drawings the present invention is shown as applied to a welt sewing machine of the Eppler type.

Figure 1 is a left side elevation of the machine, and Fig. 2 is a rear elevation.

It is not deemed necessary to refer to the sewing machine proper as it forms no feature of the present invention and the description will therefore proceed at once to the tension releasing device and the parts immediately associated therewith.

The take-up *t* consists of a bell-crank lever 1 mounted on the stud 2 secured in the frame and actuated by suitable connections with a cam on the main shaft 3 of the machine in timed relation to needle.

The pull-off *p* consists of a lever 4 secured to the short shaft 5 mounted in bearings in the frame, also actuated by suitable connections with a cam on said main shaft 3.

The tension device, indicated in a general way by the reference character T, is described as follows:—The stud 2 above referred to in connection with the take-up is extended in both directions through a plate which forms a part of the frame of the machine, and upon one end carries the said take-up lever while upon its opposite end it carries the tension wheel 6 rotatably mounted upon the stud, and the tension wheel is provided upon its rear side with a friction pad which bears against a fixed stationary surface 7, and on its front part with a collar 8 which is engaged by a collar 9 upon a sliding sleeve 10 also mounted on said stud. A friction washer 11 is preferably inter-

posed between the two surfaces. The end of the stud 2 is reduced in size and is screw-threaded to receive the adjusting nut 12 which is screwed thereon. Between the adjusting nut 12 and the sliding sleeve is interposed a spring 13 and by adjusting the pressure of the nut upon the spring the tension may be varied.

The tension releasing device consists of the following mechanism. The sleeve 10 above referred to is provided with an ear 14 to which is pivotally attached the link 15 in turn pivotally connected at its other end to the arm 16 which is secured to the hub 17 mounted upon the hollow stud 18 secured to the frame of the machine. The hub 17 carries the upwardly extended arm 19 which is secured to said hub and which carries upon its upper end a segment 20 which is loosely pivoted to said arm. By moving the arm 19 to the right, as viewed in Fig. 2, the arm 16 is turned downwardly and the sleeve 10 is caused to be moved to the right, thereby compressing the spring 13 and relieving the thread truck of its pressure, thereby releasing the tension. A spring 21 fastened at one end to the said arm 19 and at the other end to a pin 22 on the frame of the machine tends to hold the arm in the position illustrated in Fig. 2. The segment is provided with two cylindrical surfaces 23 and 24, concentric with the stud 25 by which the segment 20 is attached to the arm 19. The cylindrical surface 23 is of shorter radius of curvature than the cylindrical surface 24 and these two surfaces are separated from each other a short distance, a tooth 26 being interposed therebetween but located in a plane at one side of the plane of the surfaces, said tooth being adjustably secured to the segment by screws and a gib and groove connection. The arm 19 is provided with a segmental plate 27 having a circular slot 28 therein which is engaged by the pin 29 secured to the segment 20.

With the parts in the position shown in Fig. 2 the short radius cylindrical surface 23 engages the surface 30 of disk 31 mounted upon and secured to the main shaft 3 of the machine, which main shaft during the operation of the machine rotates in the direction of the arrow 32. The surface 30 of the disk therefore normally tends, during the operation of the machine, to hold the segment 20 in the position shown. Along-

side of the surface 30 of the disk 31 there is a toothed surface 33 which is provided with teeth which are adapted to be engaged by the tooth 26 above referred to. After the
 5 completion of the sewing of a shoe the operator grasps the hand wheel 34 and turns it in the opposite direction to its normal direction of rotation so that the main shaft is rotated backward. The slight friction between the surface 23 and the surface 30 of
 10 the disk causes the segment 20 to be rotated so as to bring the tooth 26 into engagement with one of the teeth of the toothed surface 33. The engagement of the tooth 26 with
 15 the surface 33 during the continued backward rotation of the main shaft causes the segment 20 to be still further rotated upwardly as viewed in Fig. 2 and this motion continues until said tooth 26 passes out of
 20 engagement with the teeth of the toothed surface 33 when the surface 24 rolls into contact with the surface 30 of the disk and continued backward rotation of the main shaft retains the parts in the position which
 25 they have assumed. By this means, upon the completion of the sewing of a shoe and the rotation of the main shaft backward the tension is relieved from the thread and the shoe may be taken out without the necessity
 30 for the operator to pull upon the shoe with sufficient force to draw the thread from the supply against the full tension strain.

This tension releasing device affords means acting at any position in which the
 35 main shaft may come to rest to throw off the tension immediately upon the backward rotation of the main shaft. The pin 29 by engagement with the upper end of the slot 28 limits the upward motion of the segment 20
 40 so that further backward rotation of the main shaft is inoperative to produce any further operation of the parts, the surface of the disk 30 sliding under the surface 24 of the segment. Upon the beginning of forward
 45 rotation the operations thus described are reversed, the friction between the surface 24 of the segment and the surface 30 of the disk rotating the segment 20 downward and bringing the tooth 26 into engagement
 50 with one of the teeth of the toothed surface 33 which then positively turns the segment 20 still farther down until the surface 23 comes in contact with the surface of the disk, thereby restoring tension to the thread.

55 The present invention is not limited to the embodiment thereof illustrated in the accompanying drawings and described herein, but it may be embodied in other forms of mechanism without departure therefrom.

60 It has heretofore been proposed to provide sewing machines with tension releasing devices which operated to release the tension when, during backward rotation of the main shaft of the machine, the main shaft arrived
 65 at a particular position. But this has been

found more or less objectionable for the reason that it frequently happens in bringing the sewing machine to rest after the seam sewed by it has been completed that the operator will permit the main shaft to
 70 revolve slightly beyond the position where upon backward rotation it would engage the tension releasing devices and release the tension, with the result that he has been obliged to rotate the machine through slightly more
 75 than an entire revolution backward in order to throw off the tension, whereas with the present construction it is only necessary, in whatever position the main shaft comes to rest, to give the main shaft a slight backward
 80 rotation which will at once release the tension and permit the operator to withdraw the work without resistance on the thread.

I am aware of the patent to Spencer No. 85 488,508, Dec. 20, 1892, in which a brake is employed which bears upon the periphery of a cam and which operates when the main shaft is rotated forwardly to move a lever having a pawl thereon into engagement with
 90 a toothed wheel having a friction surface thereon which engages the tension wheel, so that the tension is thereby applied, and operating upon a reverse movement of the main shaft, by movement of the friction
 95 brake in the opposite direction, to move the pawl out of engagement with the toothed wheel so as to release the friction wheel. But in this construction it will be noted the friction brake bears with sufficient pressure
 100 upon the periphery of the cam to actuate the pawl, thereby increasing the power necessary to be employed in running the machine, whereas in the present construction there is practically no friction during the
 105 normal operation of the machine in sewing, and as soon as the main shaft is rotated in the reverse direction it throws the positively acting devices into operation, which then positively release the tension wheel from
 110 pressure. The present invention may be said therefore to contemplate a tension releasing device comprising positively acting means operating automatically immediately upon reversing the direction of rotation of
 115 the main shaft to release the tension. More specifically considered it contemplates positively acting means for releasing the tension upon a reverse rotation of the main shaft thrown into action by a friction device.
 120

Having thus described my invention, without limiting it except as specifically stated in the claims, what is claimed is:

1. A tension releasing device, having, in 125 combination, a rotating member, a tension wheel, and positively acting devices connecting the rotating member and the tension wheel operating to release the tension immediately upon a reversal in the direction of 130

rotation of the rotating member, substantially as described.

2. A tension releasing device, having, in combination, a tension wheel, means for exerting pressure thereon, a device for taking the pressure off the tension wheel consisting of a lever having a toothed member connected therewith, and a rotating toothed member provided with a series of teeth and having provision for engagement with the first mentioned toothed member upon reverse rotation of said rotating member, substantially as described.

3. A tension releasing device for sewing machines, having, in combination, a tension wheel, means for exerting pressure thereon, a device for taking the pressure off the tension wheel consisting of a pivoted lever, and means for positively actuating said lever irrespective of the position of the shaft of the machine immediately upon a reversal in the direction of rotation of said shaft, substantially as described.

4. A tension releasing device, having, in combination, a rotating member, a tension wheel, and positively acting devices connecting the rotating member and the tension wheel and operating, at all positions of the rotating member, to release the tension immediately upon reverse rotation of the rotating member, substantially as described.

5. A tension releasing device, having, in combination, a rotating member, a tension wheel, and mechanism connecting the rotating member and the tension comprising a

member engaging the rotating member frictionally during rotation in one direction, and positively immediately upon a reversal in the direction of rotation so as to release the tension upon such reversal in any position of the rotating member, substantially as described.

6. A tension releasing device having, in combination, a rotating member, a tension wheel, and positively acting devices for releasing the tension comprising an annular actuating member connected with the rotating member and operative at all positions of the latter immediately upon a reversal in the direction of rotation thereof, and connections between said actuating member and the tension wheel, substantially as described.

7. A tension releasing device having, in combination, a rotating member, a tension wheel, and positively acting devices for releasing the tension immediately upon a reversal in the direction of rotation of said member comprising an actuating member rotatively connected with the rotating member and carrying an annular series of teeth, and connections between said actuating member and the tension wheel, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

ANDREW EPPLER.

Witnesses:

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FARNUM F. DORSEY.