

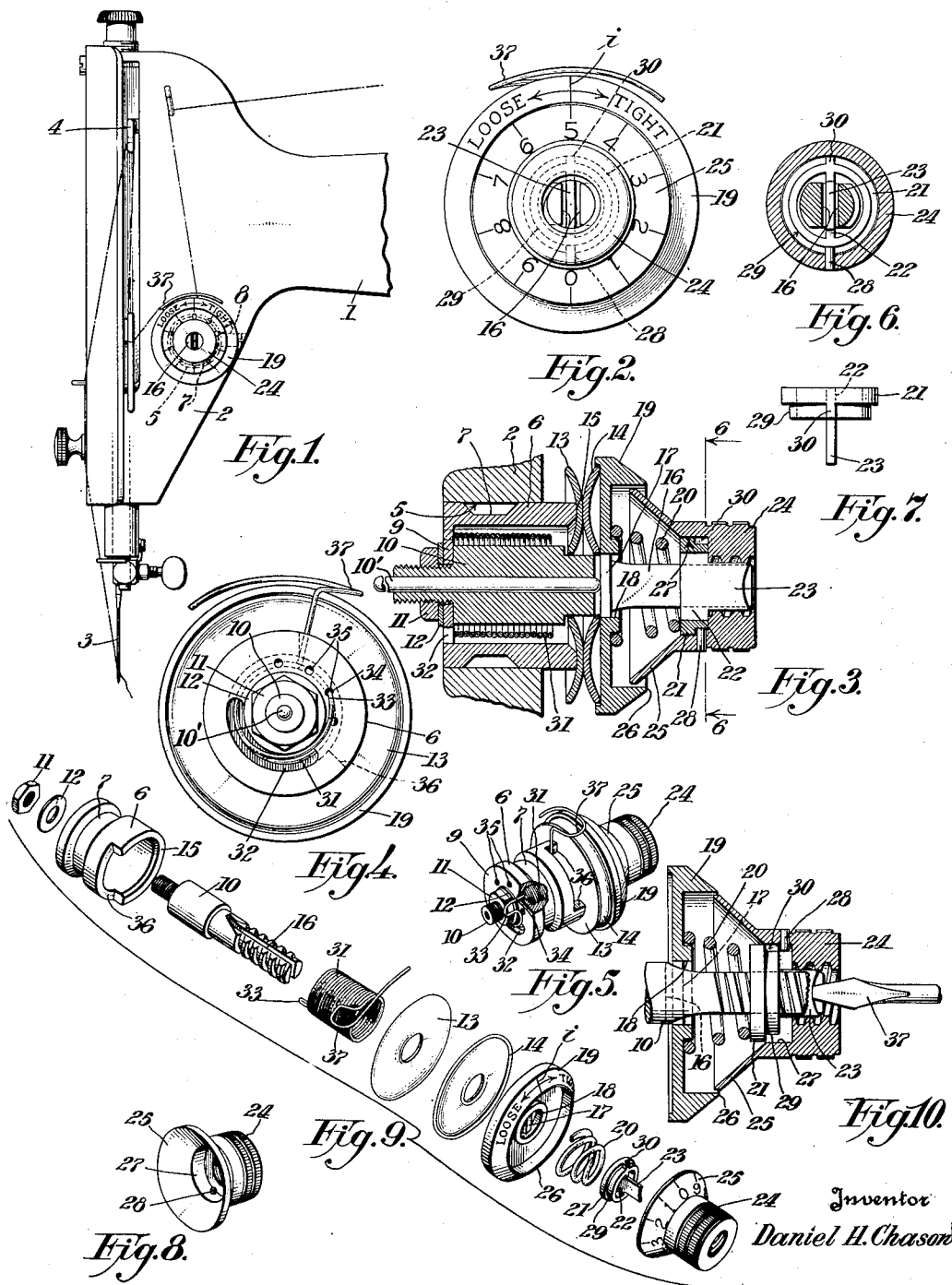
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GRADUATED TENSION REGULATOR FOR SEWING MACHINES

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GRADUATED TENSION REGULATOR FOR SEWING MACHINES

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This invention relates to sewing machines and has for an object to provide an improved device for tensioning the sewing thread or threads of such machines.

With the above and other objects in view, as will hereinafter appear, the invention consists in the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the accompanying drawings Fig. 1 is a side elevation of a portion of a sewing machine bracket-arm fitted with a tension device embodying the invention. Fig. 2 is a front elevation of the tension device. Fig. 3 is a longitudinal vertical section through the tension device. Fig. 4 is a rear elevation and Fig. 5 a perspective view of the tension device. Fig. 6 is a section on the line 6—6, Fig. 3. Fig. 7 is a top plan view of the slidably mounted dial stop member. Fig. 8 is a rearward perspective view of the dial member. Fig. 9 is a disassembled perspective view of the device, and Fig. 10 is a view similar to Fig. 3 but showing how the dial may be removed for disassembly of the device.

1 represents the bracket-arm of a sewing machine terminating in the head 2 for the usual reciprocating needle 3 and take-up 4. The head 2 is formed with an aperture 5 which receives the hollow cylindrical shank 6 of the tension device, which shank is formed with a circumferential groove 7 entered by the set-screw 8 in the head 2 to fix the tension device in working position on the sewing machine.

The shank 6 is of hollow cylindrical form and has an inner end-wall 9 formed with a central aperture through which passes the reduced and threaded inner end of the hollow stem 10 which is tightly fixed to the shank 6 by the nut 11 and washer 12. Surrounding the stem 10 are the opposed tension disks 13, 14, of which the disk 13 rests against the rim 15 of the hollow shank-member 6. The outer end-portion of the stem 10 is

formed with a longitudinal diametrical slot 16 through which passes the diameter-bar 17 crossing the central stem-embracing aperture 18 in the shallow base-cup 19 which is pressed against the tension disk 14 by the bee-hive spring 20.

The spring 20 is engaged at its outer end by the ring-shaped member, preferably in the form of a washer 21, formed with a diameter-bar 22 having a forwardly extending stem-portion 23 disposed in the slot 16 in the stem 10. The washer 21 is engaged or backed by a dial-nut 24 having an outwardly flaring conical skirt 25, the rim of which is slightly smaller than and is received within the rim 26 of the base-cup 19. The skirt 25 is preferably formed integral with and non-adjustable relative to the screw-threaded head of the nut 24. It overhangs and encloses the major portion of the bee-hive spring 20. The nut 24 is preferably screw-threaded onto the split stem 10 and has an inner cylindrically recessed portion 27 which receives the washer 21 and into which cylindrically recessed portion projects the stop-pin 28 fixed in the nut 24. The stop-pin 28 normally works in a clearance groove 29 in the washer 21, and this clearance groove is interrupted at one point in its circumference by the stop-wall 30 which limits the turning movement of the nut 24 to one rotation during which the spring 20 is stressed from minimum to maximum requirements; the strength and stiffness of the spring 20 and the pitch of the screw-threads on the stem 10 for the nut 24 being proportioned to attain this result. The washer 21 thus constitutes a stop between the nut 24 and spring 20, which stop is engaged by the stop 28 on the nut 24.

There is disposed within the hollow stem 10 the usual presser-controlled tension-release pin 10' which engages the diameter-bar 17 of the base-cup 19 and relieves the tension-disks of the pressure of the spring 20 when the usual presser-foot (not shown) is lifted.

Surrounding the stem 10 within the shank 6 is the check-spring 31 one end of which extends through the arcuate slot 32 in the end wall 9 of the shank member 6 and is formed with a loop 33 and inturned end 34 which

projects into one of the several apertures 35 in the end wall 9 and is thus anchored to the shank 6 and stem 10. The other end of the check-spring 31 extends outwardly through the slot 36 in the rim of the shank 6 and is formed with the usual thread-engaging loop 37.

The tension on the check-spring may be readily adjusted by removing the entire tension device from the aperture 5 in the head 2 and by inserting the end 34 of the check-spring in another of the anchor-holes 35. The loop 33 affords a convenient means for retraction and reinsertion of the end 34 from and in the anchor-holes 35. It is also useful in assembling the device as it permits the end 34 to be readily extracted from the arcuate slot 32 preparatory to being inserted in one of the apertures 35.

The base-cup 19 is preferably provided with an index mark *i* and the skirt 25 of the nut 24 is graduated so that, when the user has the tension correctly adjusted for a certain grade of work, the figure on the dial may be noted and the desired tension immediately restored whenever required.

The device may be taken apart by first turning the dial-nut 24 to the left or unscrewing it as far as it will go and by then depressing the washer 21 with the aid of a screw-driver blade 37, as shown in Fig. 10, to carry the stop-shoulder 30 inwardly out of range of the stop-pin 28, whereupon the dial-nut 24 may be entirely unscrewed and removed from the stem 16. The other parts may then be readily slipped off.

The stop-pin 28 is fixed in or made integral with the nut 24 and there are no small stop-screws which are likely to work loose or be lost.

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

1. In a sewing machine tension-device, the combination with the thread-engaging means, a stem, and a tension-spring, of a screw-threaded tension-regulating nut on said stem, a washer interposed between said nut and spring, said washer being keyed to said stem to slide lengthwise of the latter without rotation, and coacting stop-elements on said washer and nut to limit the movement of the latter to one rotation.

2. In a sewing machine tension-device, the combination with the thread-engaging means, a stem, and a tension-spring, of a tension-regulating dial rotatably mounted on said stem, and a ring-shaped member interposed between said dial and one end of said tension-spring, said ring-shaped member being keyed to said stem to slide lengthwise of the latter without rotation.

3. In a sewing machine tension-device, the combination with the thread-engaging means, a longitudinally slotted stem, and a tension-spring, of a screw-threaded tension-

regulating nut on said stem, a stop interposed between said nut and spring, said stop having a portion disposed in the slot in said stem, and a coacting stop on said nut to limit the movement of the latter to one rotation.

4. In a sewing machine tension-device, the combination with the thread-engaging means, a diametrically slotted stem, and a tension-spring, of a screw-threaded tension-regulating nut on said stem, a washer interposed between said nut and spring, said washer having a diameter-bar disposed in the slot in said stem, and coacting stop-elements on said washer and nut to limit the movement of the latter to one rotation, said stop-elements being permanently fixed on their respective carriers.

5. In a sewing machine tension-device, the combination with the thread-engaging means, a diametrically slotted stem, and a tension-spring, of a screw-threaded tension-regulating nut on said stem, a washer having a diameter-bar disposed in the slot in said stem, said diameter-bar having a forwardly extending stem-portion, and coacting stop-elements on said washer and nut to limit the movement of the latter to one complete rotation.

6. In a sewing machine tension-device, the combination with the thread-engaging means, a stem, and a tension-spring, of a two-part casing for said spring, one of said parts being a shallow base-cup, and the other a dial-nut screw-threaded onto said stem and having an outwardly flaring conical skirt the rim of which overhangs said spring and is slightly smaller than and is received within the rim of said cup.

7. In a sewing machine tension-device, the combination with the thread-engaging means, a stem, and a tension-spring, of a two-part casing for said spring, one of said parts being a shallow base-cup and the other a dial-nut screw-threaded onto said stem and having an outwardly flaring conical skirt the rim of which is slightly smaller than and is received within the rim of said cup, a washer interposed between said dial-nut and the outer end of said spring, said washer and said base-cup being keyed against rotation relative to said stem, and coacting stop-elements on said washer and dial-nut.

8. In a sewing machine tension-device, the combination with the thread-engaging means, a stem, a tension-spring and a tension-regulating nut, of a hollow cylindrical shank having an end-wall on which said stem is mounted, said end-wall having in it a check-spring clearance slot and a series of anchor holes, and a check-spring surrounding said stem within said hollow shank and having one of its ends extending through said clearance slot and anchored in one of said anchor holes.

9. In a sewing machine tension-device, 120

the combination with the thread-engaging means, a stem, a tension-spring and a tension-regulating nut, of a hollow cylindrical shank having an end-wall on which said stem
5 is mounted, said end-wall having in it a check-spring clearance slot and a series of anchor holes, and a check-spring surrounding said stem within said hollow shank and having one of its ends extending through said
10 clearance slot and formed with a rearwardly extending loop terminating in a forwardly extending end anchored in one of said anchor holes.

In testimony whereof, I have signed my
15 name to this specification.

DANIEL H. CHASON.

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