June 22, 1965 F. GEGAUF, JR 3,190,249

TENSIONING DEVICE FOR THE UPPER THREAD IN A SEWING MACHINE

Filed Dec. 20, 1962 2 Sheets-Sheet 1

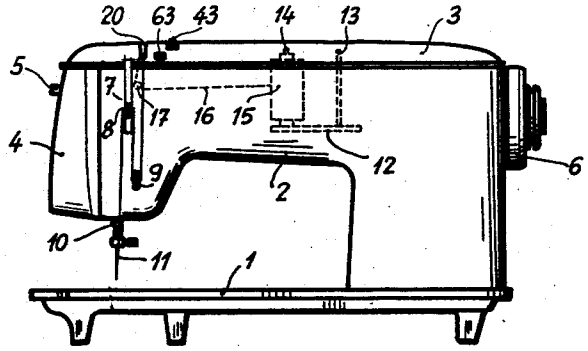

Fig. 1

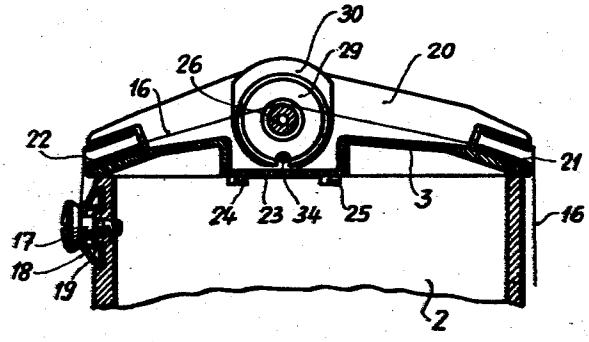

Fig. 2

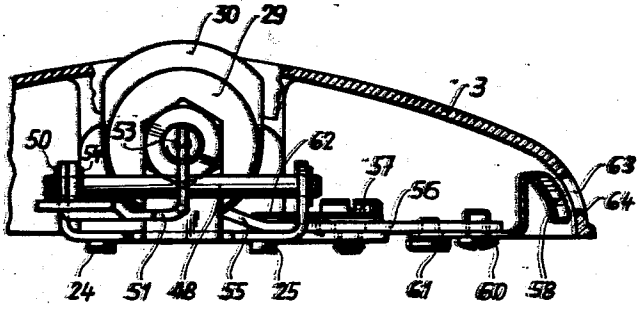

Fig. 3

Inventor:
FRITZ GEGAUF, JR.
By: McCleary and Town
Attorneys

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TENSIONING DEVICE FOR THE UPPER THREAD IN A SEWING MACHINE

Filed Dec. 20, 1962 2 Sheets-Sheet 2

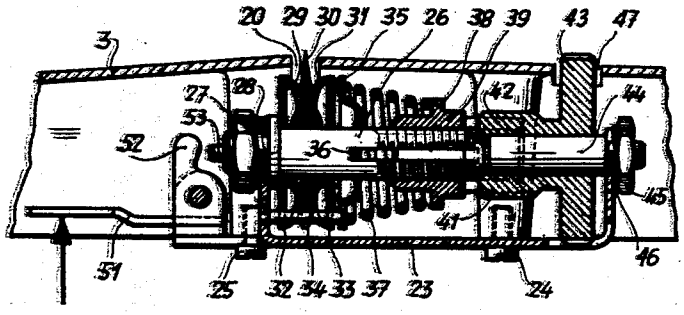

Fig. 4

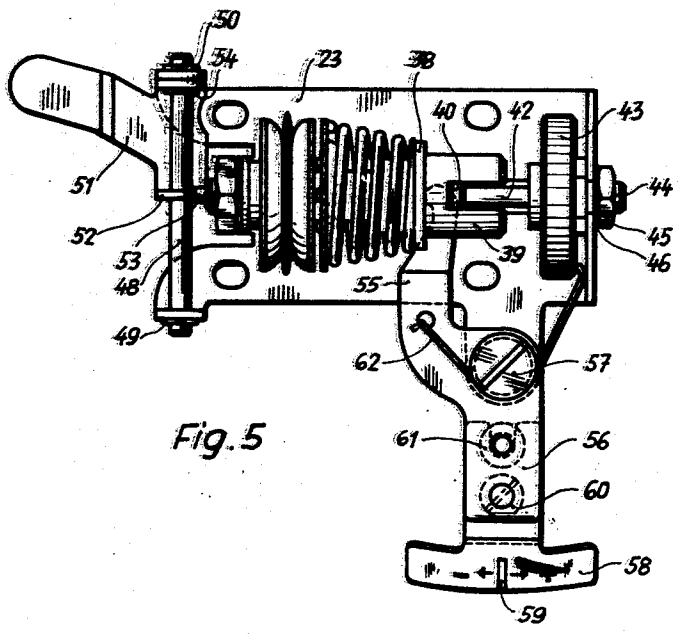

Fig. 5

Inventor:
FRITZ GEGAUF, JR.
By: McGlew and Toren
Attorneys

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TENSIONING DEVICE FOR THE UPPER THREAD IN A SEWING MACHINE

Fritz Gegauf, Jr., Steckborn, Thurgau, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft, Bernina-Nähmaschinenfabrik, Steckborn, Thurgau, Switzerland

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5 Claims. (Cl. 112—254)

The object of the present invention is to realize a tensioning device for the upper thread in a sewing machine, which device simplifies the threading of the upper thread, technically improves the sewing and further improves the appearance of the sewing machine by not being placed in the angle of view to the needle.

The tensioning devices for the upper thread known heretofore generally comprise a pair of tension disks placed outside of the sewing machine, a tensioning spring and an adjusting nut. In most of the cases these tensioning devices are assembled as a unit together with the thread control spring. Always these tensioning devices are placed below the lowermost position of the take-up lever, generally on the front side of the machine. For the threading operation the upper thread must be threaded from the bobbin, sitting on a support, through one or several open or closed thread eyes. Hereafter the thread has to be guided between the tension disks and simultaneously suspended in the control spring. Then the thread is guided to the boring in the take-up lever over the rigid deflecting bolt or control stirrup controlled by the cloth bar. From here the further threading up to the needle is effected in the usual way. This threading method is complicated and requires precise instructions to the operator. According to the construction these known tensioning devices protrude substantially from the housing of the sewing machine and hinder the free view of the needle and the work. Recently thread tensioning devices have been developed which are simplied in that the tension disks and the control spring are lodged in a slotted housing completely covered from the front side by the control nut. In these more recent tensioning devices the deflecting bolt and control stirrup are dispensed with. These tensioning devices are of large size owing to the lever arm for the control spring which is require to have a determinated length. Since the housing of the tensioning device is only partly mounted into the machine and since the protruding portion of this device also lies in the direction of view toward the needle and the work, such tensioning devices have a hindering effect. The operator has to look on both sides of the tensioning device, a drawback which may be compensated only by getting accustomed to it. Further sewing machines are known in which the tensioning device is arranged outside of the machine housing at any appropriate place, for example on the front side of the sewing machine arm, on the horizontal part thereof or the like. Such machines generally are for industrial use where a good appearance is not of substantial importance. In a sewing machine destined for the household, however, the appearance combined with a simple operation is of utmost importance.

With the present invention for the first time a thread tensioning means has been developed, the tension disks and tension spring of which are all housed within the upper arm of the sewing machine. This device is arranged in such manner that the tension disks are placed in direction of the cloth feed and thus in the path of the threading of the upper thread to the threading point at the take-up lever. The upper thread has only to be placed in its guidings and deflected at one suspension point and is then automatically drawn-in between the tension disks.

Owing to this arrangement of the thread tension device there is obtained an additional thread length between the tension device and the control device which, technically seen and owing to the elasticity of the thread, represents a substantial advantage. Even in the case of a fall-out of the control spring the sewing-machine may be operated. The manner of threading in such a machine is substantially simplified by the fact that no closed thread eyes, guiding bolts and control levers are present. Moreover, the angle of view to the needle is free, an advantage which is of substantial importance. In particular this advantage is obtained by mounting the tensioning device known per se into the horizontal part of the sewing machine upper arm, whereby the tensioning surfaces of the thread tension disks lie within the width of a slot extending transversely through the upper arm and whereby the control of the tension is effected from the outside. Preferably, means may be provided to make visible from the outside the amount of the thread tension.

Other features and advantages of the invention will become apparent from the description now to follow, of a preferred embodiment thereof, given by way of example only, and in which reference will be made to the accompanying drawing, in which:

FIGURE 1 is a front-view of a sewing machine,

FIGURE 2 is a cross-sectional view of the threading slot of the upper arm of the sewing machine,

FIGURE 3 is a cross-sectional view of the sewing machine arm in advance of the thread tension device in order to illustrate the window for the indicating device,

FIGURE 4 is a partial longitudinal sectional view of the upper part of the upper arm of the sewing machine with a double thread tensioning device, and

FIGURE 5 is a top view of the double thread tensioning device with a releasing lever and an indicating device, the upper wall of the arm being removed.

Referring now to the drawings, reference numeral 1 designates the base plate of the sewing machine onto which is mounted the upper arm 2. The horizontal part of the arm 2 is closed by a cover 3 and the front side of the arm head is closed by a cover 4 from which projects a switch button 5 for the mounted light. The machine is driven in a known way by the belt of a handwheel 6. On the front side of the arm 2 there is provided a take-up slot 7 from which projects the take-up lever 8. Below this slot, there is arranged a thread control 9. From the head of the arm projects the needle bar 10 with the needle 10. On the backside of the machine there is provided a bobbin holder 12 with two pins 13 and 14 adapted to receive bobbins. Reference numeral 15 designates a bobbin from which is withdrawn the sewing thread 16. Reference numeral 17 designates the bolt of a pre-tensioning device against which is pressed a tension disk 18 loaded by a spring 19. A transverse slot 20 in the cover 3 has on both sides thread guides 21 and 22. On the lower side of the cover 3 there is arranged a supporting plate 23 with screws 24 and 25. This plate carries a slotted thread tensioning bolt 26 held in position by a nut 27 and a resilient washer 28. In the transverse slot 20 of the cover 3 there is mounted a double thread tensioning device comprising tension disks 29, 20, 31 in such manner that the tension surfaces of the disks extend in parallel to the transverse slot 20. On both sides of the tension disks there are arranged further washers 32 and 33. As well as the tension disks as also the washers 32 and 33 are maintained in position by a pin 34 secured in the supporting plate 23. The tensioning pressure is transmitted by a pressure disk 35 engaging with its web 36 and slotted thread tensioning bolt 26. A spring 37 bears against a flange 38 of an adjusting nut 39. The latter comprises a coupling slot 40 engaged by drivers 41 and 42 of an adjusting disk 43 mounted on a bolt 44 maintained by a

nut 45 and by a lock washer 46 on the supporting plate 23. The limitation against lateral movements of the adjusting disk 43 is effected by the edges of a slot 47 in the cover 3. The supporting plate 23 is provided with an axle 48 bordered on both sides by safety disks 49 and 50. This axle 48 carries a pressure member 51 having a pressure lever 52 ahead of a tension release bolt 53. The tension release bolt 53 is housed in the hollow thread tension bolt 26 and presses against the web 36 of the pressure disk 35. Actuation of the pressure member 51 in direction of the arrow in FIGURE 4 is effected by the pressure foot mechanism (not shown). The pressure member 51 is maintained in position laterally by a lock washer 54. To the supporting plate 23 there is pivotally mounted a double lever 55, 56. The pivoting axle for this double lever 55, 56 is formed by a shoulder screw 57. At the forward end of the leg 56 a scale is adjustably arranged. This scale is designated by 58 and carries a marking 59. It is secured by a screw 60 and is adapted to be tilted and displaced about a bolt 61. The leg 55 of the double lever 55, 56 bears against the flange 38 of the adjusting nut 39. The constant contact is ascertained by a torsion spring 62 wound about the bolt 57. One leg of spring 62 is connected with the leg 55 of the lever 55, 56 and the other leg of the spring bears against the supporting plate 23. The scale 58 appears in a window 63 of the cover 3. In this window 63 there is also provided a marking 64 by means of which the thread tension may be read.

The upper thread is threaded into the machine by means of the thread tensioning device mounted into this machine by drawing the upper thread 16 between the bolt 17 and the tension disk 18, whereafter the thread is laid into the transverse slot 20 so as to pass through the thread guide 22 and then between the tension disks 29, 30 and 30, 31, respectively, and drawn off at the thread guide 21. Hereafter the thread is suspended into the control 9, threaded into the take-up lever 8 and passed through the eye of the needle 11. The sewing machine is now ready for operation. The thread tension is adjusted by the adjusting disk 43 protruding in form of a segment from the cover 3. By turning this disk in direction of the cloth feed, the adjusting nut 39 is moved toward the tension disk 29, 30, 31 and the pressure exerted by the tension disks onto the thread is increased. The double lever 55, 56 carrying the scale 58 indicates in the window the increase of the thread tension owing to the marking 59 moving to the right with respect to the counter-marking 64 in the window. If the control disk 43 is turned in the opposite direction, then the marking 59 will move to the left. The removal of the thread tension is effected in a known manner by means of the pressure bar by lifting the pressure plate at 51. Thereby the lever arm 52 presses onto the pin 53 which in turn lifts the tension disk 35 with the web 36 so that the pressure is relased from the tension disks 29, 30, 31.

Of course it is possible to modify the described arrangement in such manner that in a sewing machine the upper arm of which is closed a transverse slot is made and moreover an opening in which the thread or double thread tensioning device may be inserted. In such a case the indication for the thread tension may take place directly at the adjusting disk in connection with a rigid marking. However, such indication then is not, as in the described embodiment, in the field of view of the operator.

I claim:

1. In a sewing machine including a vertical standard supporting a substantially horizontal upper arm having an upper surface and depending side and end surfaces, and thread control means on a side surface of said arm; an upwardly opening slot extending transversely of the upper surface of said arm between said side surfaces and substantially above said thread control means; an upper thread tensioning device within said arm beneath said upper surface and between said side surfaces, and having spring biased thread tensioning disks, the thread engaging surfaces of said disks extending transversely of said arm and being located within said slot; and tension adjusting means operatively associated with said disk, and including a manual adjuster operatively associated with said tension device and extending to the exterior of said arm.

2. In a sewing machine, an upper thread tensioning device as claimed in claim 1, including a tension release device operatively associated with said disks; and a support plate mounting said thread tensioning device and said tension release device, and removably secured within said upper arm.

3. In a sewing machine, an upper thread tensioning device as claimed in claim 2, said upper arm including a cover extending longitudinally thereof and forming its upper surface; said slot being formed in said cover; said tension release device being positioned on the inner side of said cover.

4. In a sewing machine, an upper thread tensioning device as claimed in claim 1, in which said tension adjusting means comprises a bolt and a nut separately engaged with said bolt; said manual adjuster including a rotatable knob having a disk head and coupled to said nut to rotate said nut while providing for axial displacement of said nut relative to said knob; the disk head of said knob extending through a second upwardly opening slot extending transversely of the upper surface of said arm between said side surfaces, and spaced longitudinally from said first slot; the width of said second slot being of the order of a thickness of said disk head of said knob.

5. In a sewing machine, an upper thread tensioning device as claimed in claim 2, including an indicating device mounted on said supporting plate and having an inner end coupled with said tension adjusting means for movement with the latter; said indicating device having an outer end carrying tension indicia; the upper surfaces of said arm being formed with a window therethrough, and an outer end of said indicating device being visible through said window.

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JORDAN FRANKLIN, *Primary Examiner.*

DAVID J. WILLIAMOWSKY, *Examiner.*