Dec. 9, 1924. 1,518,494

R. ELCOCK

TENSIONING DEVICE FOR SEWING MACHINES

Filed May 2, 1922

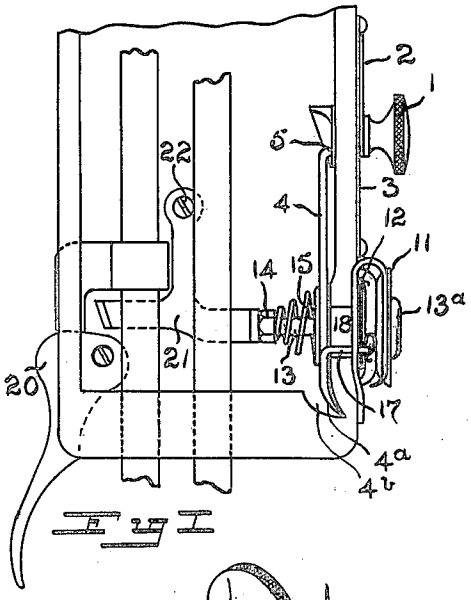


Fig I

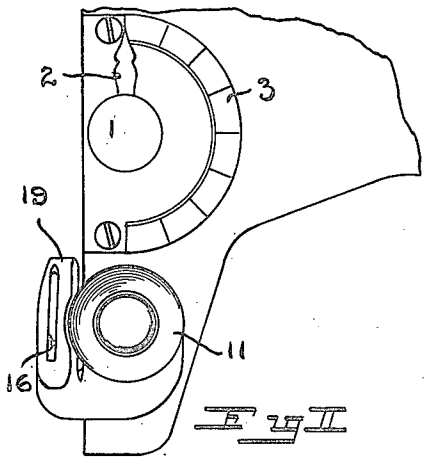


Fig II

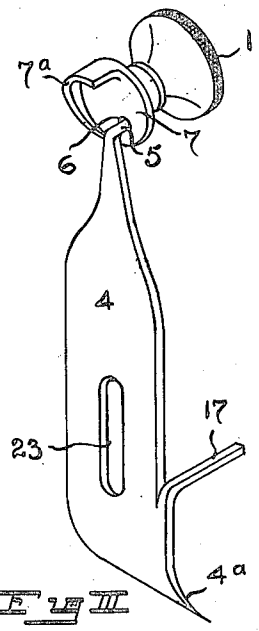


Fig III

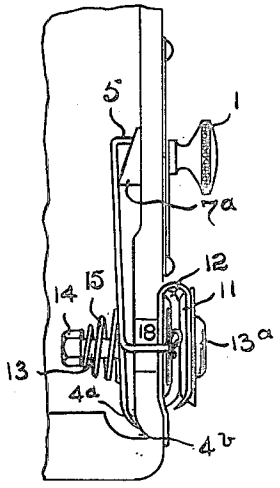


Fig IV

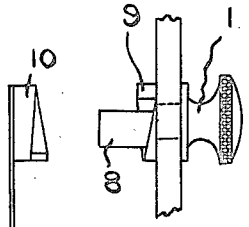


Fig VI

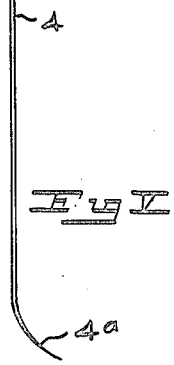


Fig V

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UNITED STATES PATENT OFFICE.

ROBERT ELCOCK, OF JOHANNESBURG, TRANSVAAL, SOUTH AFRICA.

TENSIONING DEVICE FOR SEWING MACHINES.

Application filed May 2, 1922. Serial No. 558,021.

To all whom it may concern:

Be it known that I, ROBERT ELCOCK, subject of the King of Great Britain, residing at Victoria Mansions, Eloff Street, Johannesburg, Transvaal, Province of the Union of South Africa, have invented certain new and useful Improvements in Tensioning Devices for Sewing Machines, of which the following is a specification.

This invention relates to sewing machines and has for its object the provision of means whereby the thread of a sewing machine can be subjected to any given tension and registered at sight and which can be readily applied to most types of machines without any structural alterations.

Further objects are to provide a tensioning device which will not clog owing to knots in the thread and which has an even pressure all over the contiguous surfaces. Moreover the discs are not cut by the thread owing to the fact that they are rotatable and consequently the bearing surface in contact with the thread is frequently changed. The position of the tensioning spring is also altered according to the amount of pressure applied by the tension plates.

Other advantages will be apparent from the description and the drawings.

Fig. I is a view of part of the interior of the head of a machine fitted with the invention.

Fig. II is an elevation of the head showing the tension device proper and the milled knob by which the tension is regulated.

Fig. III is a detailed view.

Fig. IV is a view similar to Fig. I with the knob in such a position as to give a maximum tension.

Fig. V is a detail view of an alternative form of construction to that shown in Figs. I and IV.

Fig. VI is a further detail view of an alternative form of construction to that shown in Figs. I and III.

1 is a milled knob carrying a pointer 2 working over a graduated scale 3 the degree of tension in the thread being regulated according to the position of the pointer on the scale as hereinafter described.

The knob is freely rotatable through 180° in the framework of the machine and is connected in the interior of the head with a plate 4 in such a manner that when the knob 1 is turned the plate is moved inwards or outwards as well as upwards or downwards.

One means of achieving this result is shown in Figs. I and IV but more clearly in Fig. III.

The plate 4 terminates at its upper extremity in a pin 5 which fits into a hole 6 in the part 7 which is secured to the knob 1.

The position of the hole 6 is eccentric to the axis of rotation of the part 7 so that a rotary movement of the knob 1 raises or lowers the plate 4.

The part 7 is provided with a cam like lip 7^a which, on rotation of the knob 1, either forces outwards or allows to move inwards the plate 4.

Another means of achieving the same result is shown in Figs. V and VI.

Fig. VI shows the knob 1 rotatably mounted, as in the previous case, in the framework of the machine. Carried on the knob and working inside the head is a cylindrical portion 8 eccentric to the axis of rotation of the knob 1. There is also a lip 9 which works against a lip 10 on the plate 4, surrounding a bearing into which the cylindrical part 8 fits.

On turning the knob 1 substantially the same movement of the plate 4 occurs as in the previous instance. The end of the plate 4 is bent inwards at 4^a and works in a recess 4^b formed in the head of the machine. The action is to throw the plate outwards when it is moved upwards by turning the milled knob 1, ensuring that there can be no sticking of the plate 4 so far as its movement to release the tension is concerned and increasing the outward movement of the lower portion of the plate. The tension plates 11 and 12 are placed in the usual position on the machine and both of them are free to turn about the tension bolt 13 which is provided with a head 13^a and a nut 14 and is itself free to turn in the frame. There is a flat on the bolt 13, not shown in the drawing, and a washer 13^b having a flat on its inner periphery, is placed between the spring and the nut so that, if the head 13^a be turned from the outside, it will not have the effect of altering the adjustment of the nut 14, since the bolt, washer and nut will revolve together.

Between the plate 4 and the nut 14 is a spring 15 which, by urging the head 13^a in-

wards, exerts a certain pressure between the plates 11 and 12. A slot 23 is provided in the plate 4 to allow the bolt 13 to pass through it and to permit movement of the plate 4.

In Fig. I the tension device is shown at the position giving minimum tension and in Fig. IV at the position giving maximum tension. It will be clear that the further the plate moves away from the framework the greater will be the pressure exerted on the thread passing between the plates 11 and 12.

The plate 4 shown in Figure 5 may be made of spring steel in which case the spring 15 may be dispensed with.

The usual thread-controlling spring 16 is provided and is controlled by a finger 17 projecting from the plate 4, the head of machine being slotted at 18 so as to allow the finger 17 free movement. A guard 19 is provided which protects the self-threading spring 16 from damage to which such springs are liable. The guard has a slot in it so that the operator can see that the thread is in position in the controlling spring.

Between the presser bar lifter 20 and the tension bolt 13 is a T shaped arm 21 pivoted to the frame at 22. When the presser bar lifter 20 is raised it forces the tension bolt 13 outwards by means of the arm 21 and there is then no pressure between the plates 11 and 12.

It will be observed that, when the knob 1 is turned so as to increase the tension for thick work the finger 17 raises the thread controlling spring thus shortening the throw of the said spring as well as increasing the pressure between the plates 11 and 12.

The pressure between the plates 11 and 12 is equal all over the contiguous surfaces and they are both movable about the bolt 13 thus obviating any possibility of a groove being worn in them by the thread.

Should any knots or thread ends get lodged between the tension plates, they will fall out when the presser bar lifter is operated, because there is then no pressure at all between the tension plates and the contiguous faces being parallel there can be no wedging action, and consequently, nothing can stop the obstruction falling out.

In addition, the fact that both tension plates are revoluble tends to prevent any such obstruction remaining between the plates, because, as they revolve, the obstruction will be carried into contact with the thread which will, owing to its movement, tend to dislodge it.

I claim:

1. Means for regulating the tension in the thread of a sewing machine comprising a knob carrying a pointer capable of movement over a graduated scale in conjunction with two revoluble tension plates, a thread controller spring, and means adapted to increase or decrease the pressure between the said plates and simultaneously to adjust the position of the said thread controller spring on movement of said knob.

2. Means for regulating the tension in the thread of a sewing machine comprising a knob carrying a pointer capable of movement over a graduated scale, a plate movably mounted inside the head of the machine, means adapted to lift and force outwardly said plate upon rotation of the knob, spring means tending to urge the plate inwardly, a tension bolt passing through a slot in the plate and a hole in the head of the machine and carrying on the outside of the head two tension plates free to revolve about the bolt which is so disposed that the head of the bolt is on the outside of the head of the machine, the threaded end carrying an adjustable nut on the inside of the head of the machine.

3. Means for regulating the tension in the thread of a sewing machine comprising a knob carrying a pointer capable of movement over a graduated scale, a plate movably mounted inside the thead of the machine, a thread controlling spring, a finger projecting from the plate adapted to act on the thread controlling spring, a guard for said spring, means adapted to lift and force outwardly said plate upon rotation of the knob, a tension bolt passing through a slot in the plate and a hole in the head of the machine, a nut on the inner end of said bolt, two tension plates free to revolve about the bolt, and a spiral spring positioned between the plate and the nut on the inner end of the bolt.

4. Means for regulating the tension in the thread of a sewing machine comprising a knob carrying a pointer capable of movement over a graduated scale, a plate movably mounted inside the head of the machine, a thread controlling spring, a finger projecting from the plate and adapted to act on the thread controlling spring, a guard for said spring, a cylindrical pin projecting at right angles to the plate and fitting into a hole positioned eccentrically on the inner part of the knob, said inner part also being provided with a cam like lip adapted to force the plate outwardly on rotation of the knob, two tension plates mounted on the outside of the head of the machine, a bolt on which the tension plates are carried, the pressure between said plates being controlled by the bolt and which is pulled inwardly with a greater or less force according to the position of the plate, and spring means in conjunction with said plate, the pressure exerted by said spring means being increased or decreased according to the position of the plate.

5. Means for regulating the tension in the

thread of a sewing machine comprising a knob carrying a pointer capable of movement over a graduated scale, a plate movably mounted inside the head of the machine, a thread controlling spring, a finger projecting from the plate and adapted to act on the thread controlling spring, a guard for said spring, a bearing on the upper end of the plate, a cylindrical portion eccentrically mounted on the knob and adapted to fit into said bearing, a cam like surface on the inner side of the knob adapted to force the plate outwardly when said knob is turned, two tension plates mounted on the outside of the head of the machine, a bolt on which the tension plates are carried, the pressure between said plates being controlled by the bolt and which is pulled inwardly with a greater or less force according to the position of the plate, and spring means in conjunction with said plate, the pressure exerted by said spring means being increased or decreased according to the position of the plate.

6. Means for regulating the tension in the thread of a sewing machine comprising two tension plates, a bolt on which said tension plates are rotatably carried, the bolt being capable of longitudinal movement, a plate, through which the bolt passes, spring means acting on said bolt, said plate being movable so that the pressure exerted by the spring on the bolt, and on the tension plates, can be varied, a knob means at the upper end of the plate adapted to lift and force inwardly the plate on rotation of said knob, and an inclined surface formed on the inside of the head, the lower end of the plate being turned towards and working on said inclined surface so that when the plate is lifted its lower end is forced inwardly.

In testimony whereof I affix my signature.

ROBERT ELCOCK.