

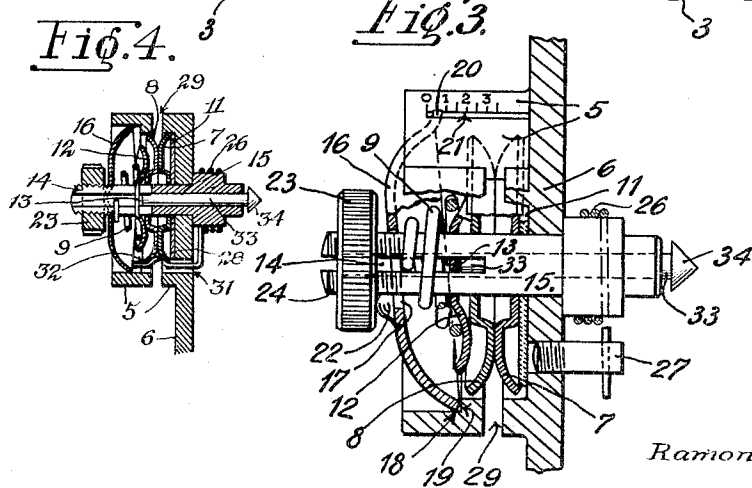
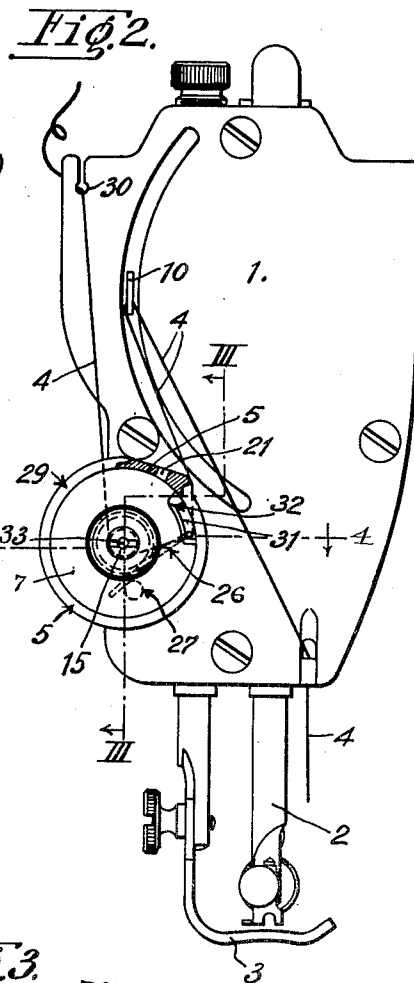
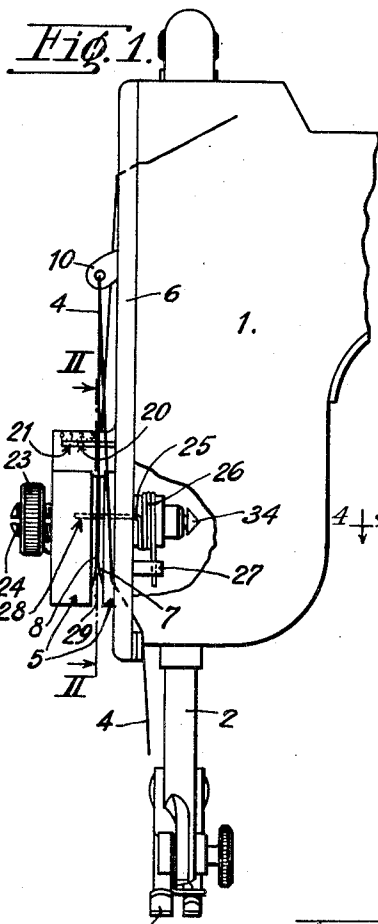
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TENSION DEVICE FOR SEWING MACHINES

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TENSION DEVICE FOR SEWING MACHINES

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This invention relates to tension devices for sewing machines and has for an object to provide an improved construction which is adapted to be mounted on the head of a sewing machine and to function continuously during the operation of the sewing machine to maintain the thread leading to the needle under a desired tension.

Another object of the invention is to provide a tension device for the thread of the sewing machine which may be manually adjusted to vary the tension at any time.

A further object, more specifically, is to provide a tension device for the thread of a sewing machine wherein automatically yielding means frictionally retard the passage of thread but yield when the thread is under extra tension.

The device according to the invention is characterized in that it has a box fixed over the head of the sewing machine and inside which are located, on the one hand, two pressing members normally pressed resiliently against each other and between which passes the thread coming from the bobbin and going to the oscillating thread-guide and, on the other hand, part of a thread-stretching spring against which the thread bears, between the oscillating thread-guide and the point where it issues from between the two above said pressing members, and where it is constantly kept stretched and makes this spring function without any risk of being itself broken when its tension increases and in that it has, to regulate the resilient pressure pressing the above said pressing members against each other, a member forming a cap for the above said box and on which a hand adjusting member acts eccentrically, so that this cap pivots on the box about a point of its edge and so that that part diametrically opposite its edge carrying a tongue situated opposite a fixed graduation may be subjected to an amplified displacement with regard to the displacement of the hand regulating member, this cap serving as an abutment for the end of a compression spring pressing with its other end the two above said pressing members against each other, the above mentioned box having a slit serving on the passage of the thread to place same by one lateral plane movement between the pressing members and against the stretching spring, said stretching spring being completely enclosed and safe from accidental damage.

The accompanying drawing shows, by way of

example, an embodiment of the device forming the subject matter of the invention.

Fig. 1 represents a view of the head of the sewing machine provided with this embodiment of the device according to the invention, part of said head being supposed broken away for the clearness of the drawing.

Fig. 2 is an end view of the head of the machine, partly in section, according to II—II of Fig. 1;

Fig. 3 is a view with part section according to III—III of Fig. 2;

Fig. 4 is a detail fragmentary sectional view through Fig. 2 on line IV—IV.

In the drawing, 1 represents the head of the sewing machine, 2 the needle carrying bar and 3 the presser-foot and 4 the needle thread.

The device comprises a casing 5 circular in shape and welded or otherwise rigidly secured to the head of the sewing machine. In this particular case, this casing is shown as being integral with this head. The bottom of said casing is thus constituted by the end plate 6 of the head 1. The casing 5 is open at its other end. Inside it are located two pressing or friction members 7, 8, each having the form of a disk and which are normally pressed resiliently against each other by means of a compression spring 9. It is between these members 7 and 8 that passes the thread 4 coming from a spool (not shown) and going to the oscillating thread guide 10. The member 7 bears against a disk 11 disposed against the plate 6. The spring 9 acts with one of its ends against the other pressing member 8, by means of a cup 12 having a finger 13 which penetrates into the slit 14 of a shaft 15 secured to the plate 6 and on which are positioned the disk 11, the pressing members 7 and 8, the cup 12 and the spring 9.

The opposite end of the spring 9 extends through the slit 14 and bears substantially against the centre of a cup-shaped member 16 whose concavity is turned towards the inside of the casing 5 and which constitutes a cover for the open end of this casing. The cover 16 has in its central part a hole 17 whereby it is also positioned on the shaft 15. This cover 16 bears at a point 18 of its periphery against a shoulder 19 formed inside the casing 5. That part of this cover diametrically opposite the point 18 ends in a tongue 20 extending into a longitudinal slot 21 of the casing 5 parallel to the shaft 15 and along which is provided a graduation as can be seen in Figs. 1 and 3.

The cover 16 has a boss or raised portion 22 disposed between its centre and the point 18, that is to say eccentrically. On this boss 22 acts a nut 23 screwing on the slit and threaded end 24 of the shaft 15.

It will easily be seen on examining Fig. 3 that by screwing or unscrewing the nut 23 on the member 24, the cover 16 is made to tilt round its rest point 18 due to the fact that the nut 23 bears against the eccentric boss 22 in the inverse direction of the action exerted by the spring 9 in the center of this cover. The tongue 20 is thus moved along the graduation when the cover oscillates. The movement of this tongue is of greater amplitude than the displacement of the nut 23, as will be easily understood, since the distance from 22 to 18 is much smaller than the distance from 20 to 18. Now, by screwing or unscrewing more or less the nut 23, the tension of the spring 9 is varied, that is to say, the pressing of the thread between the pressing members 7 and 8. The tongue 20 therefore gives an indication which is easily readable of the degree of pressing of the thread between these members 7 and 8.

The device represented also includes a thread stretching spring 25 which has a part 26 wound spirally round a portion of the shaft 15 situated inside the head of the machine (Figs. 1 and 2). The end of this spring situated near its part wound spirally bears against a fixed abutment 27 which holds this end stationary. At its other end, spring 25 has a V shaped part 28 situated inside the casing 5 (Figs. 1 and 2). The end near the V shaped part 28 is free. The top of the V formed by the part 28 is in the plane of contact of the pressing members 7 and 8. It is also in this plane which is perpendicular to the shaft 15, that is formed with a peripheral slot 29 made in the casing 5 and extending over the greater part of the periphery of this casing, as can be seen in Fig. 2 for instance. This slot 29 and the V shaped part 28 of the thread stretching spring are so arranged that, to put the thread in place, it is only necessary to take, between the thumb and forefinger, the bit of thread coming from the spool (not shown) and issuing from the notch 30, to bring it almost vertically inside the slot 29, through the left side in Fig. 2, keeping it stretched and making it oscillate round 30 and then to bend upwards by a plane movement round the shaft 15, the end of the thread held in the hand in order to bring it to the thread-guide 10. By this very simple movement, the thread is brought between the pressing members 7 and 8 and is at the same time brought into its normal position in which it bears against the inner surface of the top of the V formed by the part 28 of the stretching spring. It is the branches themselves of this V that guide and keep the thread in this position.

An opening 31 is of course provided in the plate 6 and corresponding openings 32 in the members 7 and 8 to enable the spring 25 to pass through and the part 28 to move inside the casing 5 when the tension of the thread 4 is varied.

It will be noticed, that the spring 25 is completely enclosed either in the casing 5 or in the head of the machine and that it is thus safe from accidental damage, since the user cannot come into direct contact therewith. The object of this spring, as is known, is to keep the thread 4 constantly stretched when the tension of the thread diminishes and to compress itself to

avoid a breakage of the thread when the tension of the latter suddenly increases.

The shaft 15 is hollow and inside same a rod 33 slides axially and acts on the finger 13, when, by raising the presser-foot 3, action is exerted by means not shown on a head 34 of this rod. The displacement towards the left, in Fig. 3, of this rod 33, when the presser-foot is raised, has the effect of moving the cup 12 towards the left and of withdrawing the members 7 and 8 from the action of the pressing spring 9.

It will be noted that an actuating member (not shown), rotating in a plane perpendicular to the axis of the member 15, produces simultaneously, when actuated by hand in one direction, the rising of the presser foot 3 and the displacement towards the left of the head 34. This displacement of head 34 is due to the fact that the said actuating member encounters the head 34 during its movement. This displacement of head 34 has for result that the left end of 35 acts against the tongue 13 of member 12 with the consequence that member 12 is displaced against the spring 9, thus liberating member 8 from the action of said spring. Member 8 being thus under no load, the needle thread 4 passing between 8 and 7 is no longer maintained stretched between 7 and 8.

When the actuating member is actuated in the reverse direction, it liberates the head 34 and simultaneously lowers the presser foot 3. Thus, members 12, 13 and 33 are displaced from left to right under the action of spring 9, to come again in the position shown in the drawing (Figs. 1 and 3).

I claim:

1. A device of the character described comprising a pair of friction plates through which a thread is adapted to pass so as to be maintained under tension, a spring for urging one of said plates toward the other, a shaft carrying both of said plates and said spring, a swinging cover plate having an aperture through which said shaft extends, a nut threaded onto said shaft and acting on said cover plate to swing the same against the action of said spring and to bring the spring under correct tension, said cover plate being pivoted at one peripheral point and provided with an extension at the opposite peripheral point, and means including a graduation arranged at said opposite peripheral point for indicating the position of said cover plate and the degree of tension on said thread.

2. A thread tensioning device for a sewing machine comprising a box secured to the head of the sewing machine, said box being provided with a longitudinal slot and a peripheral slot, means forming a scale alongside the longitudinal slot, a pair of friction members disposed in said box with their contacting friction surfaces in the same plane as said peripheral slot, the thread being tensioned adapted to move through said peripheral slot and between said friction members, a thread tensioning spring disposed so that one end portion will be positioned in said box and extend across said peripheral slot so as to engage the thread passing between said friction members, a cover for said box formed with a boss exterior thereof positioned at one side of the center of the cover, said cover having one portion of its edge resting on the box and the diametrically opposite portion of its edge formed as a tongue arranged with its end extending into said longitudinal slot, a compression spring within said box acting against

the inner surface of said cover and against one of said friction members for pressing said friction members together, and a hand actuated regulating member positioned to act against said boss so that when it is moved in one direction said compression spring will be compressed and said tongue will move along said longitudinal slot in one direction and when moved in the other direction said compression spring will be released and said tongue will move along said longitudinal slot in the other direction, the position of said boss causing the tongue to move a greater distance than said regulating member.

3. A thread tensioning device in accordance with claim 2, wherein the end portion of the tensioning spring located in the box is V-shaped and the point of the V-shaped portion is situated opposite said peripheral slot in the box.

4. A thread tensioning device for a sewing machine comprising a box secured to the head of the sewing machine, said box being provided with a longitudinal slot and a peripheral slot, means forming a scale alongside the longitudinal slot, a pair of friction members disposed in said box with their contacting friction surfaces in the same plane as said peripheral slot, the thread being tensioned adapted to move through said peripheral slot and between said friction members, a thread tensioning spring disposed so that one end portion will be positioned in said box and extend across said peripheral slot, said portion being formed with a V-shaped part located opposite said peripheral slot, said V-

shaped part being positioned relative to said friction members so that when the thread is moving between the friction members the two branches of the V-shaped part will guide the thread into a position in which it bears against the bottom of the V-shaped part, a cover for said box formed with a boss exterior thereof positioned at one side of the center of the cover, said cover having one portion of its edge resting on the box and the diametrically opposite portion of its edge formed as a tongue arranged with its end extending into said longitudinal slot, a compression spring within said box acting against the inner surface of said cover and against one of said friction members for pressing said friction members together, and a hand actuated regulating member positioned to act against said boss so that when it is moved in one direction said compression spring will be compressed and said tongue will move along said longitudinal slot in one direction and when moved in the other direction said compression spring will be released and said tongue will move along said longitudinal slot in the other direction, the position of said boss causing the tongue to move a greater distance than said regulating member.

5. A thread tensioning device in accordance with claim 4, wherein the end of the tensioning spring opposite the V-shaped end portion extends outside of the box and into the head of the sewing machine where it is wound helically and fixed.

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