March 12, 1940. F. L. HUENERGARDE 2,193,098

ADJUSTMENT MECHANISM

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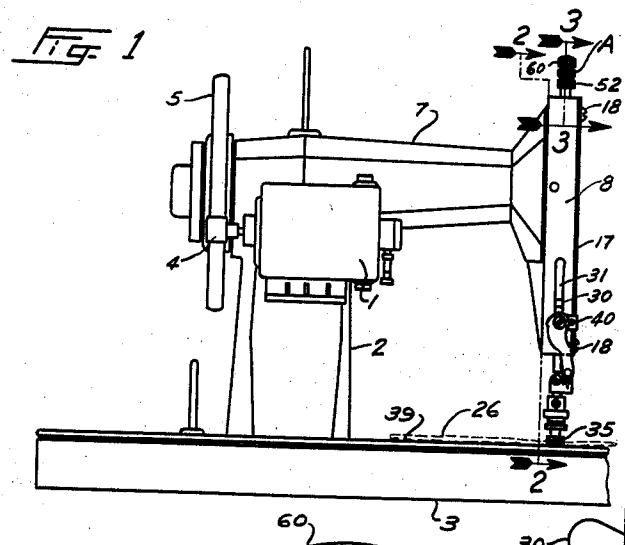


Fig. 1

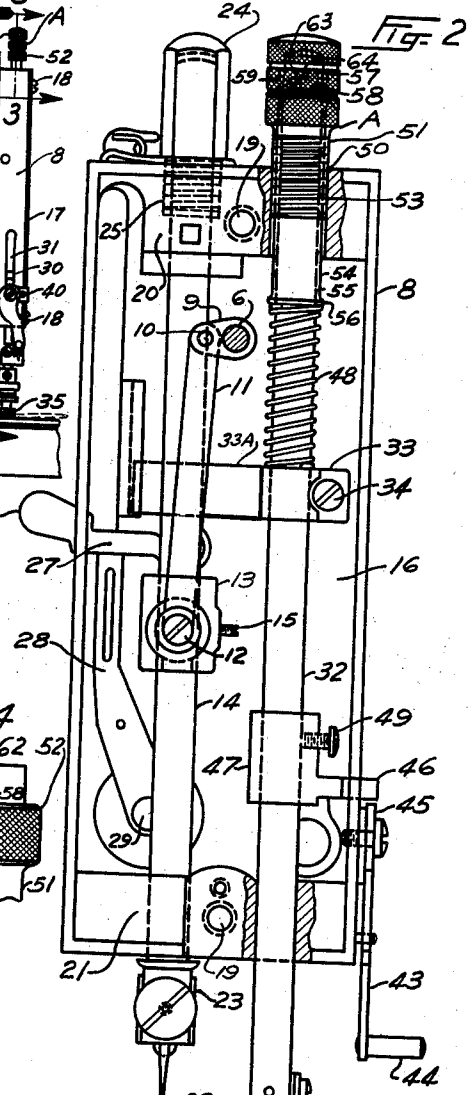


Fig. 2

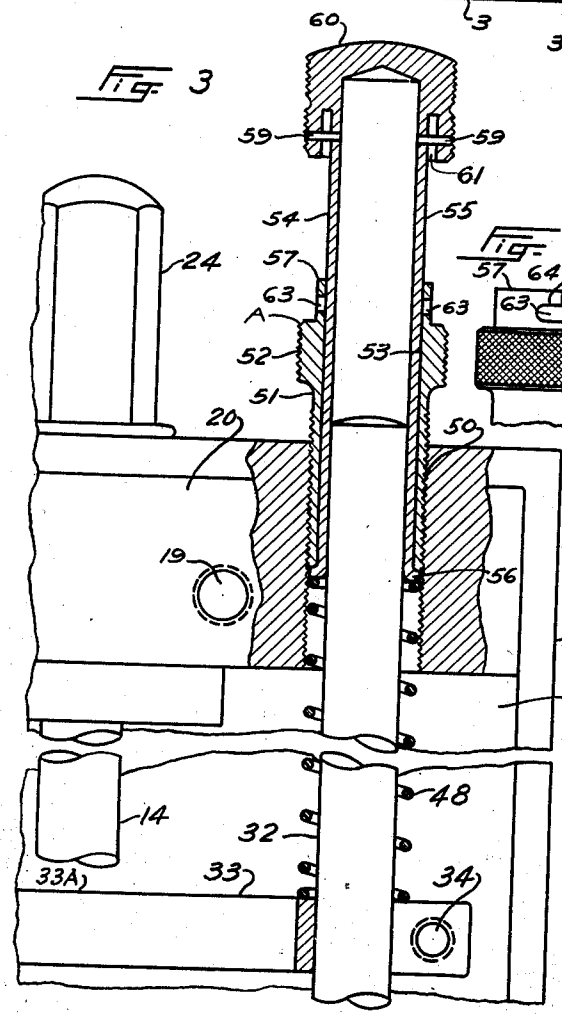


Fig. 3

Fig. 4

INVENTOR.
Floyd Leslie Huenergarde,
BY George B. Ingersoll.
ATTORNEY.

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ADJUSTMENT MECHANISM

Floyd Leslie Huenergarde, Detroit, Mich.

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2 Claims. (Cl. 112—236)

My invention relates to improvements in an adjustment mechanism for regulating the feed engagement pressure of the foot members or similar parts of sewing machines or similar units, and the objects of my invention are, first, to provide an adjustment mechanism for sewing machine mechanisms which will remove the engagement pressure of the feed mechanism thereof and at the same time prevent chattering, jumping or undesired movements of the sewing mechanism by exerting a stabilizing influence on the feed mechanism; second, to provide an adjustment mechanism for a sewing machine mechanism which will accomplish identical adjusted feed engagement pressures; third, to provide an adjustment mechanism for a sewing machine mechanism which will accomplish identical adjusted non-feed engagement pressures; fourth, to provide an adjustment mechanism comprising a fixed nut member and a slidably mounted sleeve member therein; fifth, to provide an adjustment mechanism for a sewing machine mechanism adapted to accomplish feed and non-feed engagement pressures without removal of any of its parts from assembly with the sewing machine mechanism; and sixth, to provide an adjustment mechanism for a sewing machine mechanism and comprising a nut member adapted to be adjusted to a fixed position in the sewing machine mechanism, said adjustment mechanism being adapted to provide feed and non-feed engagement pressures without adjustment of the nut member thereof.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which:

Figure 1 is a side view of a conventional sewing machine equipped with my invention; Fig. 2, a sectional view of the sewing machine taken on the line 2—2, Fig. 1, said sectional view being drawn to a larger scale than that of Fig. 1; Fig. 3, a partial sectional view of the adjusting mechanism of the sewing machine, said sectional view being taken on the line 3—3, Fig. 1, said partial sectional view being drawn to a larger scale than that of Fig. 2; and Fig. 4, a partial side view of the adjusting nut of the adjustment mechanism.

Similar numerals refer to similar parts throughout the several views.

Fig. 1 discloses a conventional sewing machine mechanism equipped with my adjustment mechanism and the sewing machine mechanism comprises the electric motor assembly 1 suitably supported by the standard or housing 2 which in turn is supported on the base 3 which is adapted for mounting on a table or similar unit or the base 3 may form a portion of a sewing machine unit incorporated in a table or desk or similar cabinet member. The electric motor assembly 1 is provided with a driving member 4 adapted to engage the driven member or wheel 5 which is operatively connected with and drives a shaft 6 rotatably supported in the overhanging arm 7 of the standard or housing 2.

The shaft 6 extends into the chamber 16 of the housing 8 supported at the outer end of the overhanging arm 7 and is provided with a crank arm 9 having a shaft portion 10 for pivotally connecting with the link 11 which is also pivotally connected with the shaft or pin 12 supported by the collar 13 mounted on the needle bar 14 and secured thereon by the screw 15.

The chamber 16 is closed at its outer side by a cover member 17 secured by screws 18 entering threaded holes 19 of the housing 8.

The needle bar 14 is slidably mounted in bearing portions of the bosses 20 and 21 of the housing 8 and is adapted to be reciprocated therein by the link 11 when driven by the shaft 6, the needle 22 being suitably supported in the collar or head portion 23 of the bar 14.

The needle bar 14 extends within and has a bearing in a hollow cap nut 24 which is provided with an extension portion 25 threadably engaging the upper portion of the boss 20 of the housing 8.

The bar 14 together with the needle 22 may be raised and lowered to and from a fabric, indicated at 26, which is being sewed or operated on. The bar may be raised or lowered by the arm 27 which is suitably connected with the bar 14 and is adapted to be slidably moved up and down and be positioned on the arm 28 secured by the screws 29, the arm 27 being provided with the handle portion 30 extending through a slot 31 in the side wall of the housing 8.

The presser foot bar 32 is slidably supported by the bosses 20 and 21 and extends through the collar 33 secured or clamped on the presser foot bar 32 by the screw 34, the collar 33 being provided with the arm 33A which limits movement and precludes rotation of the bar 32 in the conventional manner, the collar 33 and arm 33A thus moving with the bar 32, the bar 32 supporting the foot member 35 which is secured between the screw 36 and the collar 37 secured to the shaft 32 by the screw 38. The foot member 35 is adapted to engage and exert a downward thrust on the fabric 26 to hold it sufficiently tight against the upper surface 39 of the base 3 to insure the fabric 26 being fed or moved substantially in a straight line past and under the

needle 22 which, when reciprocated, moves in and out of the fabric 26, the needle 22 carrying the thread 40 which extends through the eye 41 of the needle 22, the thread 40 extending to and being connected with the thread feed mechanism in a conventional manner.

It is to be noted that the sewing machine mechanism will be provided with suitable feed mechanism, not disclosed, to move the fabric 26 past the needle 22 as the needle is operated, the foot member 35 maintaining the fabric 26 in engagement with the feed mechanism which is conventionally mounted in the base 3 below the fabric 26, the feed mechanism conventionally comprising a member to engage and intermittently feed the fabric 26 substantially in a straight line past the needle 22 and across the surface 39 of the base 3.

Also a conventional bobbin mechanism (not disclosed) is mounted in the base 3 to carry a thread, the base 3 being adapted to receive the needle 22 thereinto as it is reciprocated in the sewing operation, the shoe member 35 being provided with upturned arms 35A to facilitate movement of the fabric 26 relative thereto.

The presser foot bar 32 together with the shoe member 35 and its operating parts may be raised to a disengaged position relative to the fabric 26 by means of the lever arm 43 provided with the handle 44 together with the cam portion 45 which is adapted to engage the arm 46 and move the collar 47 together with the bar 32 upwardly against the tension of the spring or resilient member 48, the collar 47 being secured to the presser foot bar 32 by the screw 49, the arm 46 extending through a side wall of the housing 8.

It is to be noted that sewing machine mechanisms such as above described are conventionally equipped with a spring 48, which abuts the bracket 33, the bracket 33 thus enabling the end thrust of the spring 48 to move the presser foot bar 32 downwardly, together with a conventional nut member which is adapted to threadably engage the tapped hole 50 in the boss 20, said conventional nut member thus being adapted to be screwed up and down in the tapped hole 50 to adjust the tension of the spring 48 and to regulate the amount of spring tension to be exerted on the foot member 35 and against the fabric 26, the upper end of the spring 48 abutting a portion of said conventional nut member.

It is to be noted especially that in a number of sewing operations it is desirable to substantially eliminate the thrust of the spring 48 on the foot member 35 and against the fabric 26 to permit the operator to slide or move the fabric 26 transversely and irregularly relative to the normal path or direction of movement of the fabric 26 as actuated by said above mentioned feed mechanism, this being especially desirable where irregular shaped formations are to be sewed by the needle 22 and this is impossible unless the tension is removed from the foot member 35 and at the same time leaving the foot member 35 in engagement with the fabric 26 to facilitate its operation with the needle 22 and thread 40.

Now with the use of said conventional nut member and the spring 48, the elimination of the thrust of the spring 48 on the foot member 35 is conventionally accomplished by removing said conventional nut member from the sewing machine mechanism by threading it out of the tapped hole 50, the removal of said conventional nut member entirely from the sewing machine mechanism being necessary because the operator cannot visualize the position of the lower or abutting portion of said conventional nut member relative to the spring 48 as it is necessary to eliminate or remove substantially all of the thrust of the spring 48 on the shoe member 35 to permit the operator to freely move the fabric 26 under and in engagement with the foot member 35 in zig zag, criss cross, or similar irregular movements as required and without interference of the conventional feed mechanism, and this results in the misplacement or loss of the conventional nut member which has been entirely removed from the tapped hole 50 as well as rendering the shoe member 35, together with the presser foot bar 32, to be susceptible to jumping or hopping movements due to the movement of the fabric 26 by the operator and to the reactions on the fabric 26 in the sewing operation, said reactions being transferred to the presser foot bar 32 which is thus not influenced or held down because the spring 48 merely rests on the bracket 33 without tension.

In my invention, I remove said conventional nut member and replace it with a sleeve and nut assembly A which screws into the tapped hole 50, the sleeve and nut assembly A comprising the nut, screw or bushing member 51 provided with the knurled shoulder or collar 52 which is adapted to be utilized as a handle member or knob for screwing the nut member 51 in the tapped hole 50, the nut member being further provided with the bore 53 in which is slidably mounted the sleeve or bushing 54 which is provided with a bore 55 for slidably engaging the upper end of the presser foot bar 32, the sleeve or bushing 54 being provided with the flange or collar portion 56 which abuts the lower end portion of the nut member 51 to prevent the sleeve or bushing 54 from being moved longitudinally out of the upper end of the nut member 51.

The flange or collar portion 56 is constructed by spinning or displacing an end portion of the sleeve or bushing member 54 after it has been inserted through the nut member 51, thus economically forming the flange or collar portion 56 and providing means for retaining the nut member 51 and the sleeve or bushing 54 together as an assembly unit.

The nut member 51 is provided with the extension portion 57 in oppositely disposed wall portions of which are formed the notches 58 which together with the pins 59, form a bayonet lock means for retaining the sleeve or bushing 54 in its locked position relative to the nut member 51 and in which position, the spring 48 is held under compression by the sleeve or bushing 54 to exert pressure on the foot member 35 in its engagement with the fabric 26.

The pins 59 are mounted in oppositely disposed wall portions of the head portion or knob 60 of the sleeve or bushing 54 and extend across the annular groove or recess 61 which is adapted to receive the extension portion 57, of the nut member 51, therein, the pins 59 being adapted to enter and move downwardly in the vertically extending portions 62 of the notches 58 and then to move into the horizontally extending portions 63 when the sleeve or bushing 54 is partially rotated, the pins 59 engaging and being retained by engagement with the shoulder portion 64 of the notches 58.

The head portion 60 may be knurled to provide

a handle member for operating the sleeve or bushing 54.

It is to be noted that the nut member 51 will be assembled initially in the tapped hole 50 so that the spring 48 will be substantially fully extended and without tension except by that imposed by the weight of the sleeve or bushing 54 which always remains in engagement with the upper end of the spring 48, the upper end of the spring 48 entering within the lower end portion of the tapped hole 50. Thus with the sleeve or bushing 54 in its disengaged position relative to the pins 59 and the notches 58, as disclosed in Fig. 3, the spring 48 will be prevented from jumping or moving bodily along the bar 32 and this will in turn prevent any jumping or movements of the shoe member 35, the shoe member 35 being maintained in engagement with the fabric 26 at all times and yet relieving the fabric of any pressure by the shoe member 35 which would prevent irregular movements of the fabric 26 in zig zag or criss cross movements as above mentioned. Fig. 2 discloses the sleeve or bushing 54 locked in its position for retaining the spring 48 under its maximum tension to exert its maximum thrust on the shoe member 35 and the fabric 26.

In operation, the conventional nut member utilized for compressing the spring 48 of a sewing machine mechanism is removed and replaced with the sleeve and nut assembly A, the nut member 51 being threaded into the tapped hole 50 to a depth sufficient to allow the flange or collar portion 56 to engage the upper end portion of the spring 48 when it is fully extended and exerting substantially no tension on the bar 32 other than by the weight of the sleeve or bushing 54.

Then with the fabric 26 positioned under the shoe member 35 and on the surface 39 of the base 3 against and in engagement with the conventional fabric feed mechanism of the sewing machine mechanism, the needle bar 14 together with the needle 22 is reciprocated by the link 11 driven by the shaft 6 and its crank arm 9, the shaft 6 being rotatably driven by the electric motor assembly, connected to a source of supply of electric current, through the driving and driven members 4 and 5.

The thread 40, which is connected to the eye 41 of the needle 22 and to a conventional thread feed mechanism and a spool of thread, is sewed into and through the fabric and by cooperation with the thread of said conventional bobbin mechanism forms the seam or stitch construction in the fabric or cloth or similar object 26, the needle 22 being reciprocated through the fabric 26 and between the upturned arms 35A of the foot member 35.

The above mentioned conventional feed mechanism is adapted to feed the fabric 26 across the surface 39 and under the foot member 35 in substantially a straight line and the foot member 35 is held in engagement with the fabric 26 which is thus held in engagement with said conventional feed mechanism by the tension of the spring 48 when the sleeve and nut mechanism in my invention is in the position disclosed in Fig. 2, in which the sleeve or bushing 54 has been slidably moved by the operator downwardly to compress the spring 48 and until the pins 59 enter the notches 58 when the operator by gripping the head portion 60 may revolve the sleeve or bushing 54 sufficiently to bring the pins 59 under the shoulder portion 64 of the nut member 51, whereupon the sleeve or bushing 54 will be locked or retained in a position for exerting a thrust on the bar 32 to cause the foot member 35 to hold the fabric 26 against said conventional feed mechanism to cause the fabric 26 to feed and move across the surface 39 in the sewing operation.

When it is desired to remove the feeding engagement pressure between the foot member 35, the fabric 26, and the surface 39 together with said conventional feed mechanism, the operator grips the handle portion 60 and revolves the sleeve or bushing 54 until the pins 59 move out from under the shoulder portions 64 into the vertically extending portions 62 of the notches 58 whereupon the spring 48 will immediately move the sleeve or bushing 54 upwardly until the flange or collar 56 engages the end portion of the member 51, thus removing said feeding engagement pressure and permitting the operator to move the fabric in any horizontal direction to form seams or stitches of zig zag or criss cross formation to execute intricate designs, to close apertures in the fabric 26 by darning or similar operations and at the same time this is accomplished without jumping or chattering movements of the shoe member 35 and bar 32 due to the weight of the sleeve or bushing 54 being retained on the end of the spring 48 and preventing undesired movements thereof and at the same time eliminating said feeding engagement pressure. Also this is accomplished without removing any part of the sleeve and nut assembly A from the sewing machine mechanism with consequent loss or misplacement thereof.

Also the proper positioning of the spring 48 for exerting the proper feeding engagement pressure is always automatically accomplished by the operator with identical results which cannot be accomplished with conventional adjustment mechanism in which a nut member is threaded into a hole to varying depths which cannot be visualized or determined to permit the same positioning each time. Also the proper positioning of the spring 48 and the sleeve or bushing 54 is always automatically accomplished by the operator with identical results for removing the feeding engagement pressure and at the same time to prevent chattering, jumping or undesired movements of the sewing mechanism.

I claim:

1. An attachment for a sewing machine for controlling the presser foot thereof, said attachment comprising a tubular member adapted to telescope over and guide the bar of said presser foot for vertical movement, said tubular member having an enlarged lower end adapted to engage the upper end of the spring for said presser foot, a sleeve telescoped over said tubular member, said sleeve being externally threaded through a portion of its length to threadably engage an aperture in a housing surrounding said bar and having the upper end exposed above said housing, means on the upper exposed end of said sleeve spaced from the threaded portion thereof, and cooperating means adjacent the upper end of said tubular member constructed to releasably lock said sleeve to said tubular member.

2. An attachment for a sewing machine for controlling the presser foot thereof, said attachment comprising a tubular member adapted to telescope over and guide the bar of said presser foot for vertical movement, said tubular member having an enlarged lower end adapted to engage the upper end of the spring for said presser foot, a sleeve telescoped over said tubular member, said sleeve being externally threaded

through a portion of its length to threadably engage an aperture in the housing surrounding said bar, the upper end of said tubular member having a shouldered head, said head having an axially presenting annular channel adapted to receive the upper axial end of said sleeve, the upper end of said sleeve having locking notches formed therein and a pin bridging said annular channel and serving to engage said locking notches to releasably lock said sleeve and tubular member against relative axial movement.

FLOYD LESLIE HUENERGARDE.