April 19, 1927. 1,625,616

W. B. LONG

PRESSER FOOT FOR SEWING MACHINES

Filed Dec. 14, 1923

Fig. 1.

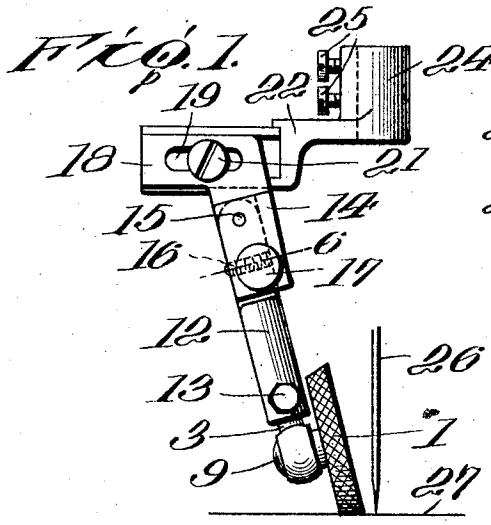


Fig. 2.

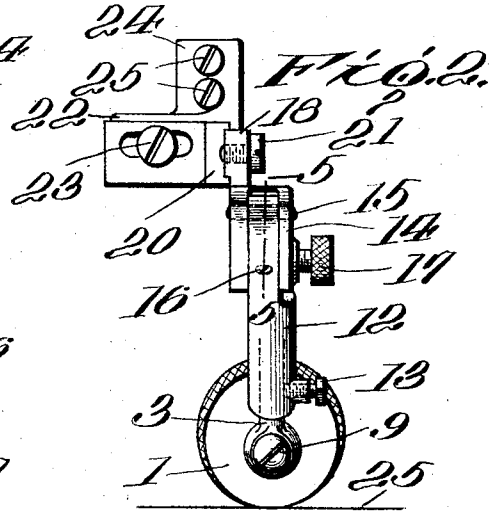


Fig. 3.

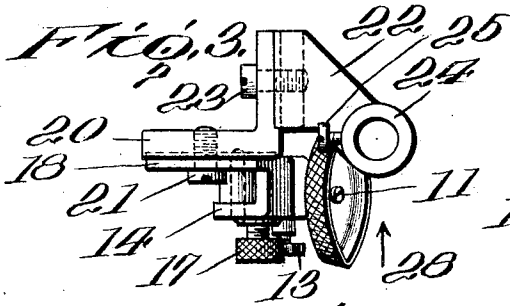


Fig. 4.

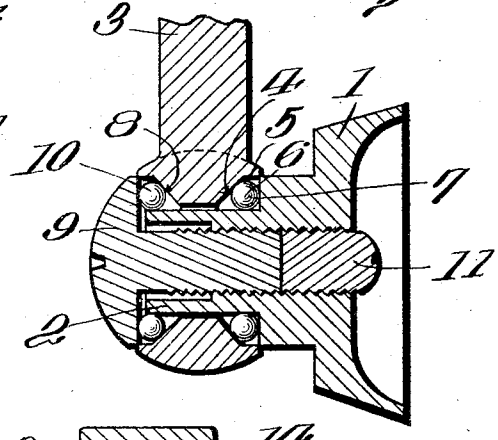


Fig. 5.

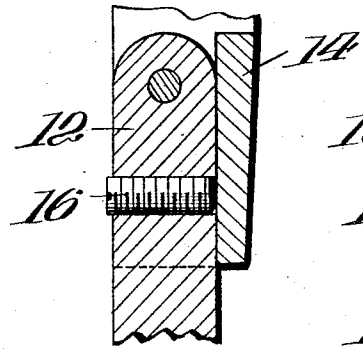
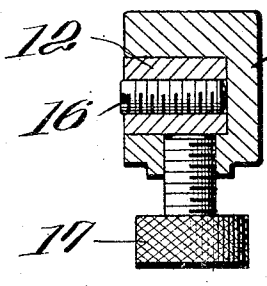


Fig. 6.



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UNITED STATES PATENT OFFICE.

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PRESSER FOOT FOR SEWING MACHINES.

Application filed December 14, 1923. Serial No. 680,670.

The invention relates to new and useful improvements in presser feet for sewing machines, and more particularly to one of the roller foot type.

An object of the invention is to provide supporting devices for a roller presser foot which is so constructed as to permit the roller to be adjusted or shifted bodily in a direction at right angles to the line of feed.

Another object of the invention is to provide supporting devices which are so constructed as to permit the roller foot to be set so as to rotate in a plane along the work support at an acute angle, and wherein said roller foot is capable of adjustment toward and from the work support in the plane of the rotating foot.

A further object of the invention is to provide supporting devices of the above character which are so constructed that the angle of the roller member to the work support may be adjusted and the foot bodily shifted laterally toward and from the needle.

A still further object of the invention is to provide a mounting for the roller foot which takes up both the radial and the end thrust on the bearing support for the roller foot.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention—

Figure 1 is a front view showing a portion of a sewing machine having my improvement applied thereto;

Fig. 2 is a side view of the same;

Fig. 3 is a plan view;

Fig. 4 is a sectional view through the bearing support for the roller foot;

Fig. 5 is a sectional view on the line 5—5 of Fig. 2;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1;

The invention is directed broadly to a roller presser foot for sewing machines wherein the roller foot is mounted on a supporting member so that said foot is capable of rotating in a plane at an angle to the work support. The foot is so arranged in the machine as to bear on the material adjacent the needle. The support for the roller foot includes a member which is capable of being adjusted bodily in a direction at right angles to the line of feed so that said roller foot may be moved away from or nearer the needle, as desired. Said foot is also mounted so that it may be adjusted toward and from the work support in its plane of rotation, which is at an angle to the work support. Furthermore, the foot is so mounted that it may be swung toward and from the needle, and may be set in different angular positions relative to the needle and work support.

Referring more in detail to the drawings, my improved roller presser foot consists of a wheel or rotatable member 1 which has its peripheral surface inclined to its plane of rotation. In other words, the peripheral surface of the foot is shaped as the frustrum of a cone. As shown in Fig. 4, this roller foot 1 is provided with a reduced shank portion 2 which extends through an opening in the supporting member 3. This supporting member 3 has an inclined or cone face 4 and a cylindrical face 5 which forms a ball race for a series of balls 6. The shank portion has a shoulder 7 which forms the other face of the race for the balls. At the other side of the supporting member 3 there is another cone face 8 which together with the shank 2 and a headed member 9 form a ball race for a series of balls 10. This headed member 9 is threaded and the shank member 2 has an internal recess which is likewise threaded to receive the headed member, so that the headed member may be threaded into the shank and thus hold the parts in assembled position.

A set screw 11 located centrally of the roller foot is likewise threaded into the central opening through the foot, and is adapted to screw up against the end of the headed member 9, and thus lock the headed member in its desired set position.

The support 3 is in the form of an elon-

gated cylindrical member and is adapted to be inserted in a similarly shaped recess in an arm 12 and is held in adjusted position in said recess by means of a set screw 13. This arm 12 is pivoted to a bracket 14 by means of a pivot pin 15. The bracket is slotted so that the arm which is mounted in the slot can swing in said slot, and with the swinging of the arm, the roller foot can be moved toward and from the needle.

Threaded into the arm 12 is a stop screw 16. The arm 12 swinging on the pivot 15 will be limited by the adjustable stop and can be held in set position by means of a clamping screw 17. The bracket 14 has a right-angled section 18 provided with a slot 19. This right-angled section of the bracket is adapted to be secured to a second bracket 20 (see Fig. 3). A bolt 21 passing through the slot 19 serves to hold the bracket 14 in adjusted positions on the bracket 20. Said bracket 20 is provided with suitable guiding ribs so as to aid in holding the bracket 14 and preventing the same from turning on its bolt. The bracket 20 is in turn secured to the main bracket 22 by means of a clamping bolt 23. Here again there is a ribbed construction between the bracket 20 and the main supporting bracket 22 which prevents one from turning on the other. The main supporting bracket has a sleeve 24 through which the main presser bar of the machine passes, and clamping screws 25, 25 will secure this sleeve to the presser bar.

The needle is indicated at 26 and the plane of the work support is indicated at 27. The direction of feed is indicated by the arrow 28 in Fig. 3.

From the above it will be apparent that the bearing surface of the roller foot is located so as to rotate in a plane inclined to the work support and also the path of reciprocation of the needle. The surface of the roller foot which makes contact with the work support or the material on the work support, is parallel with the work support at its point of contact. If, for any reason it is desired to throw the pressure of the foot more heavily upon the edge thereof adjacent the needle, the angular position of the supporting member for the roller foot can be shifted, or this supporting member can be shifted so as to insure that the foot will engage the fabric with even pressure clear across its periphery. This is accomplished by means of the stop screw 16 which limits the movement of the pivoted arm. It will readily be seen that by adjusting this stop screw, the angular set position of the arm 12 can be varied, and through the aid of the clamping bolt 17, said arm can be clamped in any desired set position. By releasing the clamping bolt 13, the supporting member 3 may be adjusted in its recess in the arm 12, and this provides an adjustment of the rotating foot in a direction parallel with its plane of rotation, and facilitates the setting thereof so that it will be properly positioned relative to the needle and the stitching point. By loosening the clamping bolt 21, the bracket 14 can be adjusted in a direction toward and from the plane of the needle, and thus it is that the roller foot may be shifted bodily in a direction at right angles to the foot and toward and from the plane of reciprocation of the needle. By loosening the bolt 23, the bracket 20 can be adjusted in a direction parallel with the line of feed, and thus it is that the roller foot may be shifted forwardly or rearwardly relative to the needle so as to properly position the pressure point of the foot on the material relative to the stitching point.

When the roller foot is set as shown in the drawings and as described above, there is a lateral or side pressure on the roller foot and there is also a radial pressure on the foot, as the supporting brackets for the foot are mounted on the presser bar which is yieldingly pressed toward the work support, and thus it is that the roller foot is yieldingly pressed toward the work support. Both the lateral thrust and the radial thrust on the roller foot comes on the balls running in the raceways, and by adjusting the headed member 9, all side play and radial play can be taken up, and this provides an extremely free running roller which, of course, is very necessary in a sewing machine. The set screw 11 serves as a means for clamping the headed member 9 so that it cannot work loose.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is—

1. The combination of a needle, a roller presser foot, a supporting means for the roller presser foot including a presser bar, a bracket carried thereby, and bodily adjustable in a direction parallel with the direction of feed, a second bracket carried by said first-named bracket, and adjustable in a direction at right angles to the direction of feed, said second bracket having a depending portion, an arm pivoted to said depending portion and carrying said roller presser foot, and means for shifting said arm about this pivot and clamping said arm in adjusted positions.

2. The combination of a needle, a roller presser foot, a supporting means for the roller presser foot including a presser bar, a bracket carried thereby and bodily adjustable in a direction parallel with the direction of feed, a second bracket carried by said

first-named bracket and adjustable in a direction at right angles to the direction of feed, said second bracket having a depending portion, said depending portion having a recess formed therein, an arm pivoted in said recess and adapted to swing in a plane at right angles to the direction of feed, a roller presser foot carried by said arm, an adjustable stop carried by the arm and adapted to engage said depending portion for limiting the swinging movement of said arm, and means for clamping said arm in adjusted positions.

3. The combination of a needle, a roller presser foot having a conical fabric engaging surface, a pivoted arm supporting said roller presser foot and permitting said roller presser foot to swing in a direction toward and away from the needle, an adjustable stop for limiting the movement of the presser foot toward the needle, and clamping means for clamping the presser foot in any set position determined by the stop.

4. The combination of a roller presser foot adapted to engage the material at one side of the needle and having a conical fabric engaging surface, a member on which said roller foot is pivotally supported, supporting means including an arm having a recess to receive said member carrying the roller foot, means for clamping said member in adjusted positions in said recess, a bracket to which said arm is pivoted, a stop for limiting the swinging movement of the arm, clamping means for clamping the arm in said adjusted positions, a second bracket to which said first-named bracket is adjustably connected so that said bracket carrying the arm can be shifted in a direction at right angles to the line of feed.

5. The combination of a roller presser foot adapted to engage the material at one side of the needle and having a conical fabric engaging surface, a member on which said roller foot is pivotally supported, supporting means including an arm having a recess to receive said member carrying the roller foot, means for clamping said member in adjusted positions in said recess, a bracket to which said arm is pivoted, a stop for limiting the swinging movement of the arm, clamping means for clamping the arm in said adjusted positions, a second bracket to which said first-named bracket is adjustably connected so that said bracket carrying the arm can be shifted in a direction at right angles to the line of feed, a main bracket to which said second bracket is adjustably connected so that the second bracket can be adjusted in a direction parallel with the line of feed.

6. The combination of a roller presser foot, means for supporting said roller presser foot including an arm having a recess therethrough forming cone-shaped spaced walls, said roller presser foot having a reduced shank extending through said recess, and a shoulder forming with one of said cone-shaped walls a raceway, balls in said raceway, a headed member adapted to be adjustably secured to the shank of the roller presser foot whereby said head forms with the other cone-shaped wall a raceway, and balls in said raceway.

7. The combination of a roller presser foot, means for supporting said roller presser foot including an arm having a recess therethrough forming cone-shaped spaced walls, said roller presser foot having a reduced shank extending through said recess, and a shoulder forming with one of said cone-shaped walls a raceway, balls in said raceway, a headed member adapted to be adjustably secured to the shank of the roller presser foot whereby said head forms with the other cone-shaped wall a raceway, balls in said raceway, said headed member having a threaded connection with the shank of the roller foot, and means for locking said headed threaded member in adjusted positions.

8. The combination of a roller presser foot having a reduced shank concentric to the center of the roller presser foot, supporting means for said roller presser foot including an arm having a recess formed therethrough to receive the shank of the roller foot, said roller foot having a central recess, a headed member threaded in said central recess for securing the roller foot to its support, and ball bearings between the shank of the roller foot and the supporting member therefor said supporting means having tapered walls engaged by said ball bearings whereby the adjustment of the headed member into the shank will take up both the lateral and the radial thrusts on the roller foot.

9. The combination of a roller presser foot, supporting means therefor including an arm having a recess therethrough, said arm having cone-shaped walls at each side thereof extending to said recess, said roller foot having a reduced shank adapted to extend through said recess, said shank being threaded, a headed member adapted to be threaded into said shank so that the head on said member forms with the cone-shaped wall adjacent thereto, a ball race, said reduced shank also forming a vertical wall which cooperates with the other cone-shaped wall to form a ball race, and balls located in said raceways.

10. The combination of a roller presser foot, supporting means therefor including an arm having a recess therethrough, said arm having cone-shaped walls at each side thereof extending to said recess, said roller foot having a reduced shank adapted to extend through said recess, said shank being threaded, a headed member adapted to be threaded into said shank so that the head on

said member forms with the cone-shaped wall adjacent thereto, a ball race, said reduced shank also forming a vertical wall which cooperates with the other cone-shaped wall to form a ball race, balls located in said raceways, and a threaded locking screw located axially of said roller foot and adapted to bear against the inner end of said headed member for locking the same in adjusted positions.

In testimony whereof, I affix my signature.

WILLIAM B. LONG.