

[54] **PRESSER FOOT FOR A SEWING MACHINE**

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**FOREIGN PATENTS OR APPLICATIONS**

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[57] **ABSTRACT**

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A presser foot for a sewing machine comprises a part provided with a presser member, movable with respect to an attaching part for securing the foot to a presser bar of the machine, an actuating member mounted on one of said parts for the relative movement of said parts between two end positions, and an elastic linking element mounted between said actuating member and the other said part. The actuating member may be a manual driving device or driven by a part rigid with a movable member of the machine.

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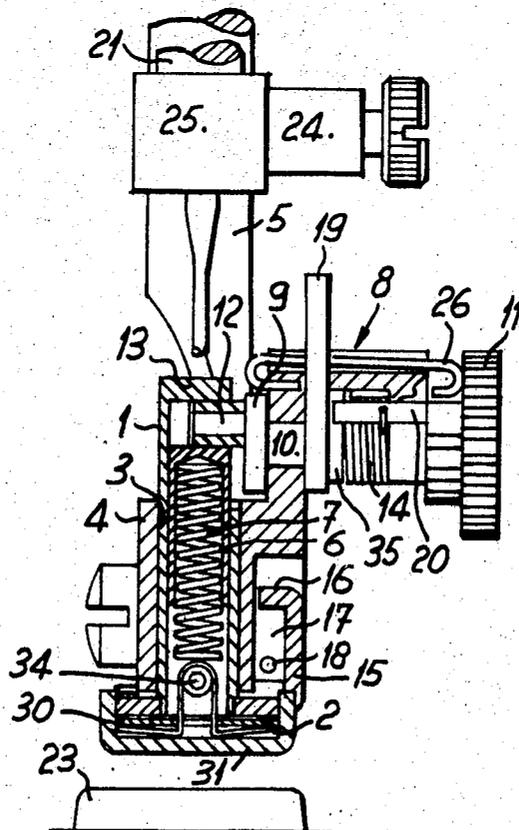
[58] Field of Search ..... 112/235-240, 76

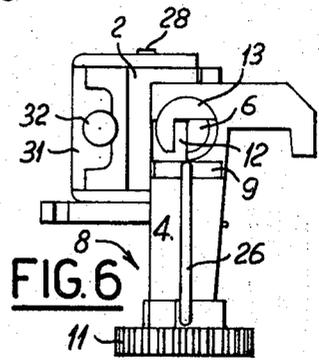
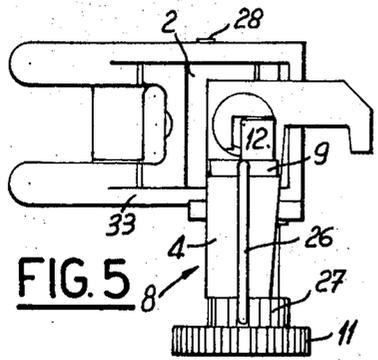
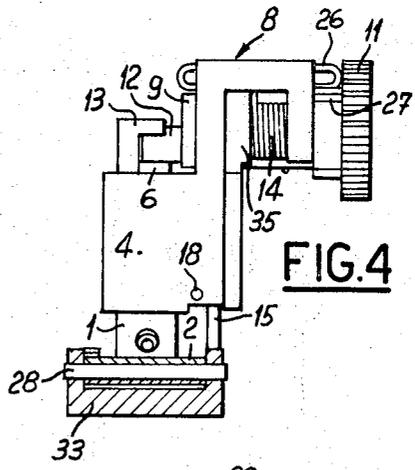
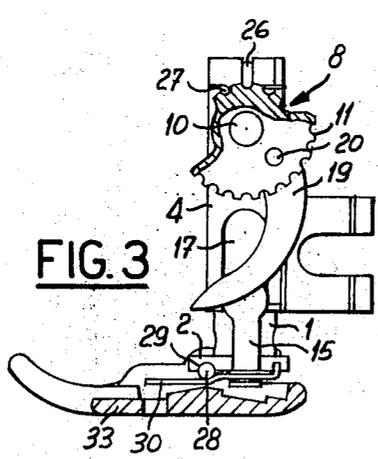
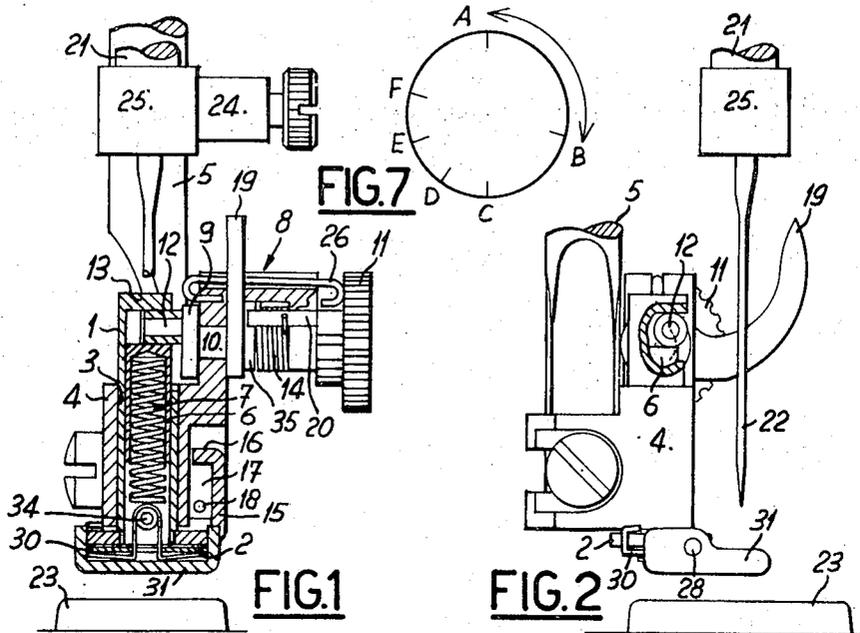
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**6 Claims, 7 Drawing Figures**





## PRESSER FOOT FOR A SEWING MACHINE

The present invention relates to a presser foot for a sewing machine.

Modern sewing machines are provided with a presser bar enabling constant pressure to be exerted on the fabric to be sewn. According to the thickness and the texture of the fabric, this presser bar is provided with a fixed foot of various height or shape. For certain darning or embroidery operations, on the other hand, there is substituted, for fixed foot, a so called "skipping" foot which cooperates with the needle bar so as only to press the cloth when the needle penetrates therein.

It is an object of the present invention to substitute for these various feet one and the same foot capable of serving simultaneously as a "skipping" foot and as a fixed foot and to vary the pressure exerted on the cloth to be sewn through the fixed foot.

According to the invention, there is provided a presser foot for sewing machines comprising a part, provided with a presser member, movable with respect to a part for attachment to a presser bar with which the machine is provided and a control member for the relative displacement of these two parts between two extreme positions mounted on one of said parts.

This presser foot is characterized by an elastic linking element mounted between the control member and the other part.

The accompanying drawing shows, by way of example, one embodiment of a presser foot according to the invention, given of course purely by way of illustrative but non-limiting example. In the drawing:

FIG. 1 shows a front view, in axial section, of the presser foot mounted on the presser bar of a sewing machine and adjusted to carry out a darning operation;

FIG. 2 is a side elevation from left to right of the embodiment shown in FIG. 1;

FIG. 3 is a side elevation from right to left of the embodiment of FIG. 1, with portions removed, of the presser foot adjusted for sewing;

FIG. 4 is a front elevation from left to right of FIG. 3;

FIG. 5 is a top plan view corresponding to FIG. 3, that is to say for the sewing adjustment;

FIG. 6 is a top plan view, similar to FIG. 5 corresponding to darning adjustment;

FIG. 7 illustrates diagrammatically the various adjustment positions of the presser foot.

The presser foot shown in the drawing comprises a part 4 for attachment to the presser bar 5 of a sewing machine. This attaching part or member 4 has a passage or opening 3 in which a tubular part 1 is slidably mounted. The tubular part 1 is provided with a presser member 2 at its lower end. A piston 6, closed at its upper end, is mounted in sliding manner in the tubular part 1, its lower open end being directed towards the end of the tubular part 1 provided with the presser member 2. A spring 7 supported on one hand against the stop 34 which is carried by the lower end of the tubular part 1 provided with the presser member 2 and, on the other hand, against the bottom of the bush 6, is arranged in said bush.

The presser member 2 can be provided with various soles according to the type of sewing that it is desired to carry out, these soles being provided with a cross bar 28 which is housed in a transverse groove 29 the

presser member 2 in which it is held by a spring 30 carried by the presser member 2.

In FIGS. 1, 2 and 6, the presser member 2 is provided with a sole 31 with a flat bottom pierced by a hole 32 for the needle 22, particularly suitable for darning or embroidery operations, in cooperation with a plate 23. In FIGS. 3 to 5 on the other hand, the presser member 2 is provided with a sole 33 having a forked end incurved upwardly intended for zigzag stitch sewing, in cooperation with the transporter of the machine effecting the advance of the cloth to be sewn.

An actuating member 8 for the movement of the tubular part 1 in the passage 3 of the part 4 for the foot to the presser bar 5 is mounted on said attaching part 4.

This actuating member 8 comprises a crank disc 9 the rotary axle 10 of which is provided with a manual driving knob 11. The axle traverses the wall of attaching part 4 of the foot at right angles with respect to the passage 3. The crank disc 9 has an eccentric crank pin 12 extending into the tubular part 1 through an orifice formed in the cylindrical wall of the latter. The crank pin 12 is thus inserted between the closed end of the piston 6 and a shoulder 13 at the upper end of the tubular part 1. A return spring 14, surrounding the axle 10 of the manual driving knob 11 of the crank disc 9, tends to maintain the latter in a position where its crank pin 12 lifts the tubular part 1 by acting on its shoulder 13. This position, comprising the upper position of the presser foot, is shown in FIGS. 1, 2 and 6.

In a lower position of the presser foot shown in FIGS. 3, 4 and 5, on the other hand, the eccentric crank pin 12 causes an axial displacement downwardly of the piston 6 which, by means of the spring 7, drives the tubular part 1 downwardly. This relative displacement of the tubular part 1 with respect to the attaching part 4 is however limited by a stop member 15, rigid with the presser member 2 through one of its ends and of which the other end 16, curved at a right angle, slides in a groove 17 of the attaching part 4 provided with an arresting stop 18. This stop member 15 cooperates on the other hand with the groove 17 to prevent the tubular part 1 bearing the presser member 2, from turning around its axis, inside the attaching part 4 for the foot of the presser bar 5.

A lever 19, mounted in rotary manner around the axle 10 of the crank disc 9, is capable of cooperating through a shoulder 35 with a drive bar 20 on the axle 10, in order to cause rotation of the latter against the action of the return spring 14. The lever 19 is rotated around the axle 10 by the needle bar 21 of a sewing machine when the foot is mounted on the presser bar 5 of the latter in the upper position as shown in FIGS. 1, 2 and 6.

In causing the needle 22 to penetrate into a piece of fabric arranged on the support plate 23, having a hole for the passage of the needle, and intended to prevent the fabric from being drawn in the transporter of the machine, the needle bar 21 simultaneously lowers the lever 19 by means of a lateral projection 24 on the device 25 for attaching the needle 22 to needle bar 21. The crank pin 12 then causes an axial movement of the piston 6 which lowers the presser member 2 by means of spring 7, in order to keep the cloth firmly pressed against the plate 23 while the needle 22 penetrates into the cloth and it from being displaced during this operation.

When the needle 22 rises again, the lever 19 is freed and returns into its inactive position shown in FIG. 2 under the action of the return spring 14. Simultaneously, the crank pin 12 resumes its upper position shown in FIG. 1 and lifts the presser member 2. It is thus possible to move the cloth on the plate 23 when the needle 22 is no longer engaged in the cloth, between two successive stitches.

As shown in FIG. 3, if the axle 10 of the crank disc 9 is caused to rotate, against the effect of the return spring 14, by means of the manual driving knob 11, beyond the position that it occupies when the lever 19 is lowered by the needle bar 21, the presser member 2 of the presser foot can be locked in its lower position. This locking is effected by the curved end of a spring 26, rigid with the attaching part 4, engaged in one of a plurality of notches 27 provided in an axial tubular extension of the manual drive knob 11. The notches correspond to various positions of the crank pin 12 in which the latter more or less compresses the spring 7 by causing the axial position of the 6 to vary with respect to the tubular part 1.

These various positions of adjustment of the presser foot are illustrated diagrammatically in FIG. 7.

Between A and B, the crank pin 12 drives the piston 6 axially in the direction of the cloth to be sewn on the lowering of the lever 19 by the lateral projection 24 of the needle bar 21 in order to lower the presser member 2 onto the fabric on the penetration of the needle into the latter. This movement is reversible due to the return spring 14.

At C, the crank pin 12 occurs in its lowest position, so that the spring 7 undergoes the strongest compression and confers on the presser member 2 a maximum pressure. In this position achieved by rotating the knob 11 in anti-clockwise direction, the curved end of the spring 26 penetrates into the first notch of the notches 27 and immobilizes the manual drive knob 11 against the effect of the return spring 14.

If the knob 11 is further rotated in anti-clockwise direction, the latter is successively locked by the curved end of the spring 26 in notches corresponding to the positions D, E and F of the crank pin 12 in which the latter compresses the spring 7 less and less which, in its turn, applies decreasing pressure to the presser member 2.

Numerous modifications in a constructional sense of the presser foot described can be contemplated.

Instead of modifying the pressure exerted by the presser member 2 on the fabric to be sewn by means of an excentric crank pin 12, mounted on a crank disc 9, it could be effected, for example, by means of a pin penetrating into the tubular part 1 through a slot, parallel to the axis of the latter, formed in the part 4, this slot

having in one of its edges locking notches corresponding to the positions C, D, E, F of the pin.

I claim:

1. A presser foot for a sewing machine including, a presser bar and a needle bar, said presser foot comprising an attaching member for securing said presser foot to said presser bar, said attaching member having an opening extending longitudinally thereof, a tubular part including a shoulder at its upper end, a presser member at its lower end and having an opening in its sidewall beneath said shoulder, said tubular part slidably mounted in the opening in said attaching member and further including a stop member at its lower end adjacent said presser member, actuating means for controlling the relative movements of said tubular part and said attaching member, said means including an axle rotatably mounted in said attaching member normal to the opening therein, a manual driving knob at one end of said axle, an eccentric crank pin mounted on said axle at its opposite end, said crank pin extending into the sidewall opening in said tubular part, a piston slidably mounted in said tubular part, said piston having a closed upper end and an open lower end, a spring within said piston, the lower end of said spring abutting said stop member, whereby rotation of said axle and crank pin causes movement of said tubular part upwardly or downwardly by acting on said shoulder or said piston.

2. A presser foot according to claim 1 wherein, said actuating means includes a manual operating device for rotating said axle and crank pin.

3. A presser foot according to claim 1 wherein, said actuating means includes a member rotatably mounted on said axle and driven by a member rigid with said needle bar when the latter moves downwardly in a first zone of relative movement of said tubular part and said attaching member, and driven by a manual driving device in a second zone of relative movement of said tubular part and said attaching member.

4. A presser foot according to claim 1 wherein, said actuating means includes a return spring tending to restore said eccentric crank pin into the position where it actuates said shoulder of the tubular part.

5. A presser foot according to claim 4 including, means for locking said manual driving knob against the action of said return spring in at least one position in which said crank pin actuates said piston.

6. A presser foot according to claim 4 wherein, said actuating means includes a lever rotatably mounted on said axle and a lateral projection on said needle bar driving said lever when said needle bar moves in a downward direction.

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