March 18, 1958 J. L. ROCKERATH 2,827,006

LOW INERTIA PRESSER MECHANISMS FOR SEWING MACHINES

Filed March 9, 1955 2 Sheets-Sheet 1

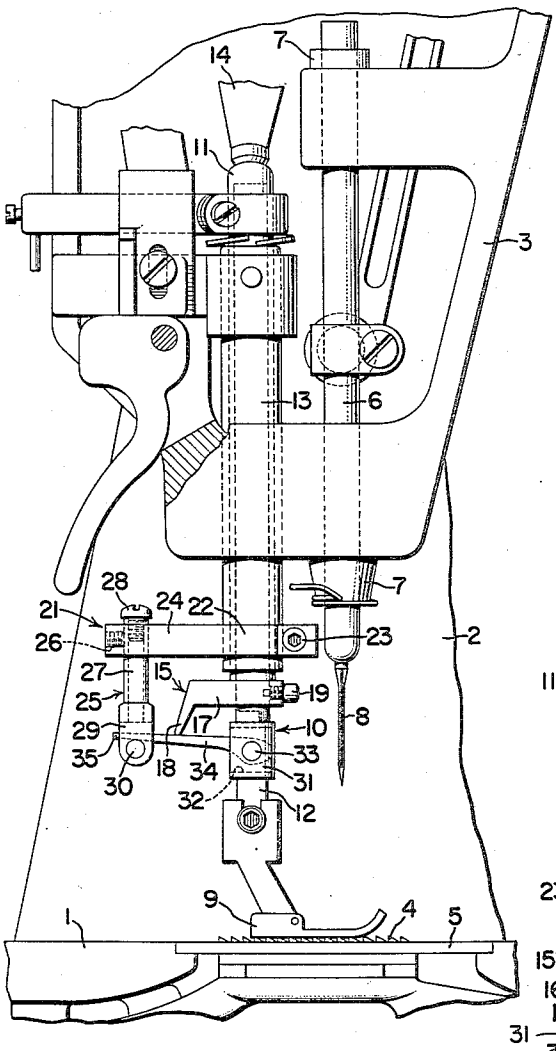
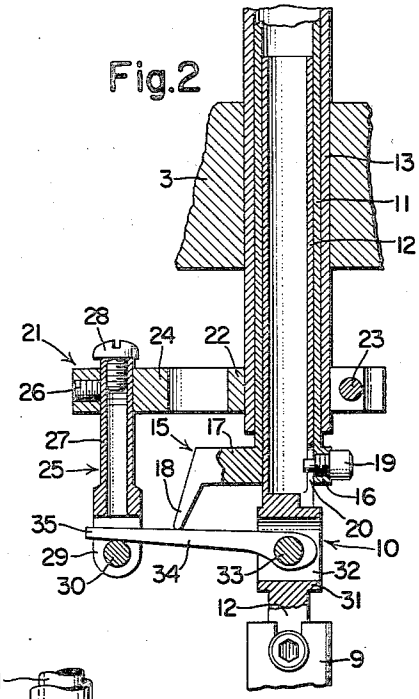


Fig. 1

Fig. 2



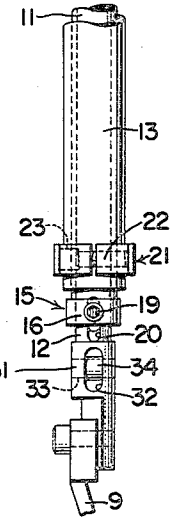


Fig. 3

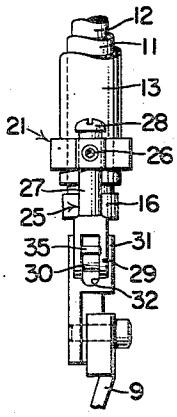


Fig. 4

WITNESS

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LOW INERTIA PRESSER MECHANISMS FOR SEWING MACHINES

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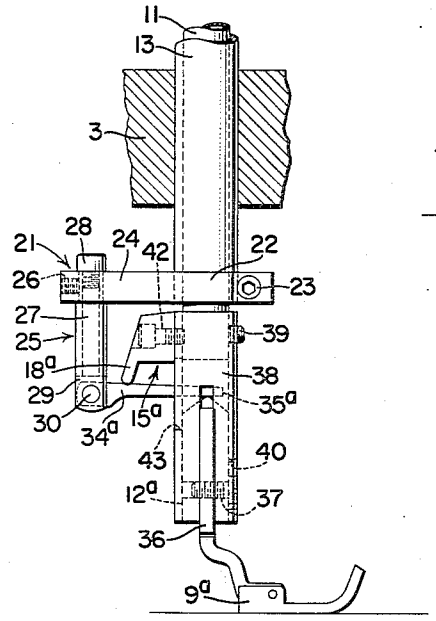


Fig.5

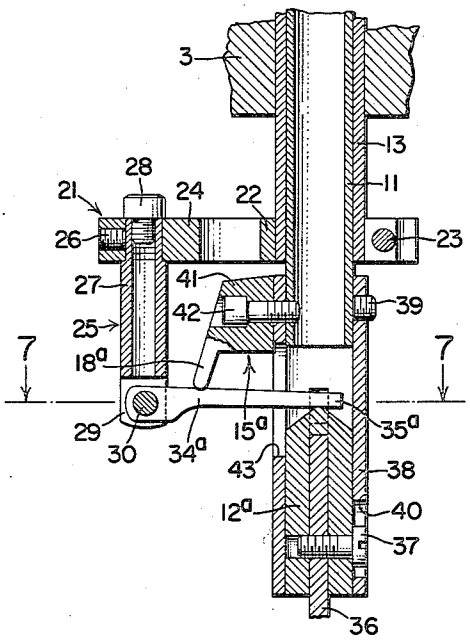


Fig.6

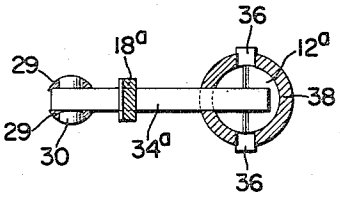


Fig.7

WITNESS

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LOW INERTIA PRESSER MECHANISMS FOR SEWING MACHINES

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4 Claims. (Cl. 112—235)

The present invention relates to sewing machines and has for a primary object to provide an improved low inertia presser mechanism therefor. More specifically, it is an object of this invention to provide a low inertia presser mechanism that is more economical, efficient and durable, and which can be interchanged with the presser mechanism normally provided on existing machines with a minimum substitution of parts.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it when read in conjunction with the accompanying drawings in which:

Fig. 1 is a fragmentary head end elevation view of a sewing machine embodying the present invention, parts of the machine being removed, broken away and shown in section to illustrate the invention better.

Fig. 2 is a detail sectional view on an enlarged scale of a portion of the presser mechanism of the machine of Fig. 1, taken vertically through the axis of the presser-bar.

Figs. 3 and 4 are detail views in elevation of the presser mechanism per se of Fig. 1, the views being taken on opposite sides of the mechanism as illustrated in Fig. 1.

Fig. 5 is a view similar to Fig. 1 but illustrating per se, a modified form of the invention.

Fig. 6 is similar to Fig. 2 but illustrating the modification of Fig. 5.

Fig. 7 is a detail sectional view taken substantially on the line 7—7 of Fig. 6.

As illustrated in the drawings, the present invention is embodied in a sewing machine having a frame including a bed 1, a standard 2, and a head 3 overhanging the bed. The feeding mechanism is illustrated as comprising a feed-dog 4 adapted to advance the work over a throat-plate 5, it being understood that the feed-dog is actuated through the usual four-motion cycle by any conventional mechanism. The illustrated portions of the stitching mechanism comprises a needle-bar 6 journaled in the head 3 for longitudinal reciprocation and carrying a needle 8 at its lower end.

The presser mechanism which serves to hold the work down against the throat-plate 5 and to hold the work in engagement with the feed-dogs 4 comprises a presser-foot 9 secured to the lower end of a presser-bar generally designated 10. The presser-bar 10 consists of a hollow upper section 11 and a hollow lower section 12, the mass of the upper section being high relative to the mass of the lower section. The lower section is telescopically received within the upper section 11 which is, in turn, telescopically received within an elongated guide-bushing 13. The upper presser-bar section 11 extends all the way through the guide-bushing 13 and the upper end

thereof is engaged by the end of a conventional leaf type presser-bar spring 14. On the lower end of the upper presser-bar section 11 which extends below the guide-bushing 13 is what is herein termed an abutment 15 that comprises a collar-like portion 16 surrounding the section 11 and a laterally extending arm portion 17 terminating on a downwardly extending finger 18. A set screw 19 is threaded through the colar-like portion 16 of the abutment, through the wall of the section 11, and has a reduced end that extends into a vertical slot 20 formed in the lower presser-bar section 12, thus limiting the free travel between the sections 11 and 12 and to prevent relative rotation.

There is provided a bracket generally designated 21 which comprises a split collar 22 clamped to the exposed lower end of the guide-bushing 13 by means of a screw 23 that draws the split ends of the collar together about the guide-bushing 13. Extending laterally from the collar 22 is an arm 24 that carries a depending fulcrum member 25 which is secured in the arm 24 by a set screw 26 and comprises a hollow tubular body portion 27 closed at the top by a cap-screw 28 and having a bifurcated lower end defining spaced tines 29 between which is disposed a fulcrum pin 30.

The lower presser-bar section 12 is provided with an enlargement 31 disposed immediately above the presser-foot, which enlargement is provided with a vertical slot 32 having a pivot pin 33 extending therethrough. A lever 34 is mounted at one end upon the pivot pin 33 for pivotal movement relative thereto whereby the respective end of the lever 34 is secured to the lower presser-bar section 11 for movement axially thereof but for pivotal movement relative thereto. The free end of the lever 34, designated 35, rests on the fulcrum pin 30 and the finger 18 of the abutment 15 contacts the lever 34 at a point between the ends thereof.

From the mechanics of the structure, it will be seen that the lever 34 functions as a lever of the second class, the presser-bar spring 14 urging the upper presser-bar section 11 downwardly and thus exerting a force through the abutment 15 and its finger 18 against the lever 34 at an intermediate point, the lever 34 pivoting about the stationary fulcrum pin 30, and thereby urging the lower presser-bar section 12 downwardly and resiliently holding the presser-foot in engagement with the feed-dog and throat-plate. It will, of course, be apparent that because of the leverage action of the lever 34, only a fraction of the force of the spring 14 will be transmitted to the lower presser-bar section 12. In addition, when the presser-foot 9 is lifted by the feed-dog 4 during operation of the machine, only the same fraction of the movement and velocity imparted to the presser-foot and lower presser-bar section 12 will be imparted to the relatively heavier upper presser-bar section 11. The effects of the inertia of the presser-bar will therefore be correspondingly reduced.

In Figs. 5, 6 and 7, there is illustrated a modification of the invention. All the elements included in Figs. 5, 6 and 7 which are the same as the corresponding elements as disclosed in Figs. 1–4 are designated by the same reference numerals whereas all the elements in Figs. 5, 6 and 7 which are functionally similar to the various elements of Figs. 1–4 are designated by the same reference numeral as the corresponding element but with the subdesignation "*a*."

The presser-foot 9*a* of Figs. 5, 6 and 7 is carried by a lower presser-bar section 12*a*, the shank 36 of the presser-foot being received within a slot formed vertically inwardly from the lower end of the section 12*a* and being secured therein by a screw 37. The lower presser-bar section 12*a* is in the form of a cylindrical plug-like element that is slidably received within the bore of a sleeve-

like extension 38 of the upper presser-bar section 11, which extension is secured to the section 11 by means of screws as 49. The head of the screw 37 is seated in a vertical slot 40 in the extension 38 thereby limiting sliding of the section 12*a* and preventing withdrawal thereof from the extension 38. An abutment member 15*a* comprises a body portion 41 secured to the upper end of the extension 38 by a screw 42, and having a downwardly extending finger 18*a*.

The lever 34*a* is pivotally mounted at one end on the fulcrum pin 30 and the free end 35*a* extends through a slot 43 formed in the side wall of the extension 38 to a position overlying the lower presser-bar section 12*a*. The finger 18*a* rests on the lever 34*a* at a point intermediate the ends thereof. In the same manner as with the device disclosed in Figs. 1–4, the the spring pressure exerted against the upper presser-bar section 11 is transmitted to the lower presser-bar section 12*a* and to the presser-foot, through the abutment 15*a* and the lever 34*a*, and because of the leverage only a fraction of this spring pressure is actually transmitted to the presser-foot 9*a*. The presser-foot 9*a* and the lower presser-bar section 12*a* are thus held depressed by a force that is less than the total force exerted against the upper presser-bar section 11 and in the same manner, the amount of movement and the velocity imparted to the upper presser-bar section 11 is less than that imparted to the presser-foot 9*a* by the feed-dog, thus reducing the inertia effects of the presser mechanism.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

Having thus set forth the nature of the invention, what I claim herein is:

1. A low inertia presser mechanism for a sewing machine having a frame including a head, said mechanism comprising a presser-bar mounted for endwise reciprocation in said head, and having two relatively movable sections consisting of an upper section and a lower section, a presser-foot carried by the lower section, means acting upon said upper section to depress the same, a lever operatively connected at one end to said lower presser-bar section for exerting a force axially-directed thereon, means on said frame for providing a stationary fulcrum at the other end of said lever, and means for connecting the upper presser-bar section to an intermediate point of said lever whereby the force depressing said upper presser-bar section will be transmitted to said lower presser-bar section through said lever.

2. A low inertia presser mechanism for a sewing machine having a frame including a head, said mechanism comprising a presser-bar mounted for endwise reciprocation in said head and having two relatively movable sections consisting of an upper section slidably mounted in said head and a lower section slidably supported by the upper section, a presser-foot carried at the lower end of the lower section, a presser-bar spring acting upon said upper section to depress the same, a lever operatively connected to said lower presser-bar section for exerting an axially-directed force thereon, an abutment carried at the lower end of the upper presser-bar section and contacting said lever at a point spaced from said presser-bar, and a bracket carried by said frame and providing a fulcrum for said lever at a point spaced outwardly of said abutment from said presser-bar.

3. A low inertia presser mechanism for a sewing machine having a frame including a head, said mechanism comprising a guide-bushing carried by said head, a presser-bar mounted for endwise reciprocation in said guide-bushing, said presser-bar comprising two relatively movable sections consisting of an upper section extending through said guide-bushing and a lower section slidably received within the upper section, a presser-foot carried at the lower end of the lower section, a presser-bar spring acting upon said upper section to depress the same, a lever operatively connected at one end to said lower presser-bar section for exerting an axially-directed force thereon, a bracket carried by said guide-bushing and providing a fulcrum for the other end of said lever, and an abutment carried by the upper presser-bar section and operatively engaging said lever at a point intermediate the ends thereof, whereby the force exerted by said presser-bar spring upon the upper presser-bar section will be transmitted to said lower presser-bar section through said lever.

4. In a sewing machine having a frame including a head, stitching mechanism, drop-feed mechanism adapted to advance the work past the stitching mechanism, and a low inertia presser mechanism, said presser mechanism comprising a presser-bar mounted for endwise reciprocation in said head and having two relatively movable sections of different mass, a first one of said sections having a low mass and a second one of said sections having a high mass, a work-engaging presser-member secured to said first presser-bar section, means for exerting a force axially of said second presser-bar section, a lever operatively connected to said first presser-bar section for exerting an axially-directed force thereon, and means providing a fulcrum for said lever, said second presser-bar section being operatively connected to a point on said lever intermediate the fulcrum and the connection to said first presser-bar section whereby only a fraction of the movement and velocity imparted to said first presser-bar section by said feeding mechanism will be transmitted to said second presser-bar section thereby reducing the inertia of said presser-bar.

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