June 6, 1939. A. H. DE VOE 2,161,141

PRESSER MECHANISM FOR SEWING MACHINES

Filed March 18, 1938 2 Sheets-Sheet 1

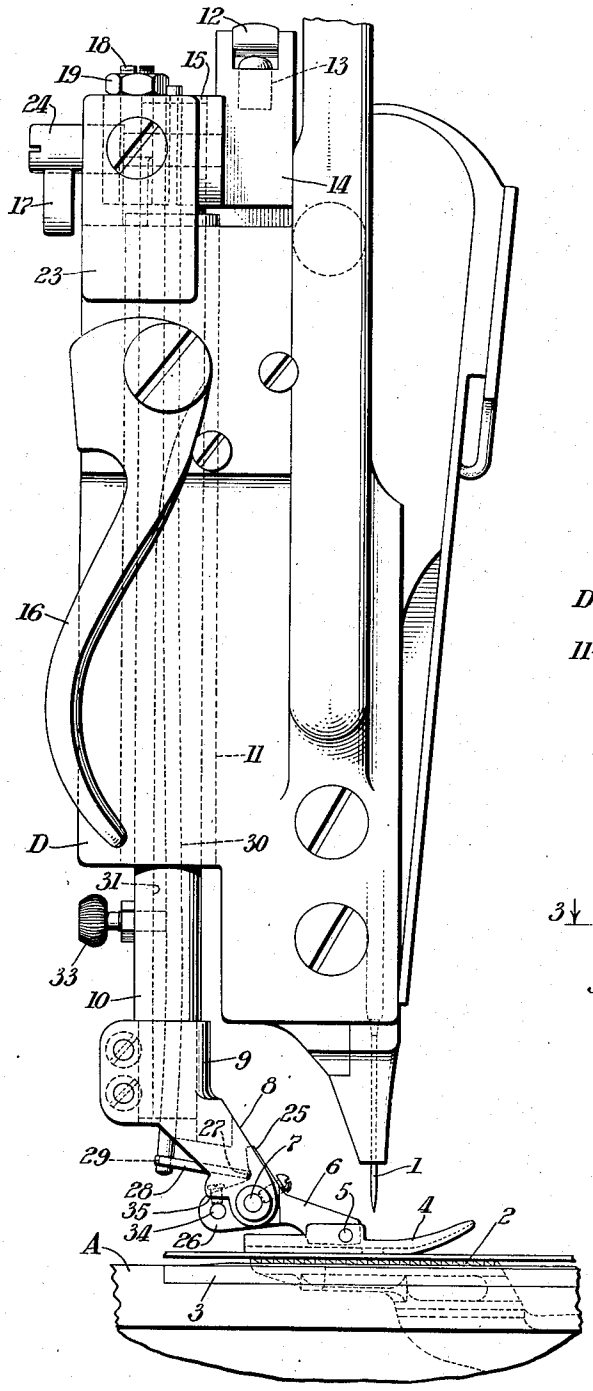



Fig. 1.

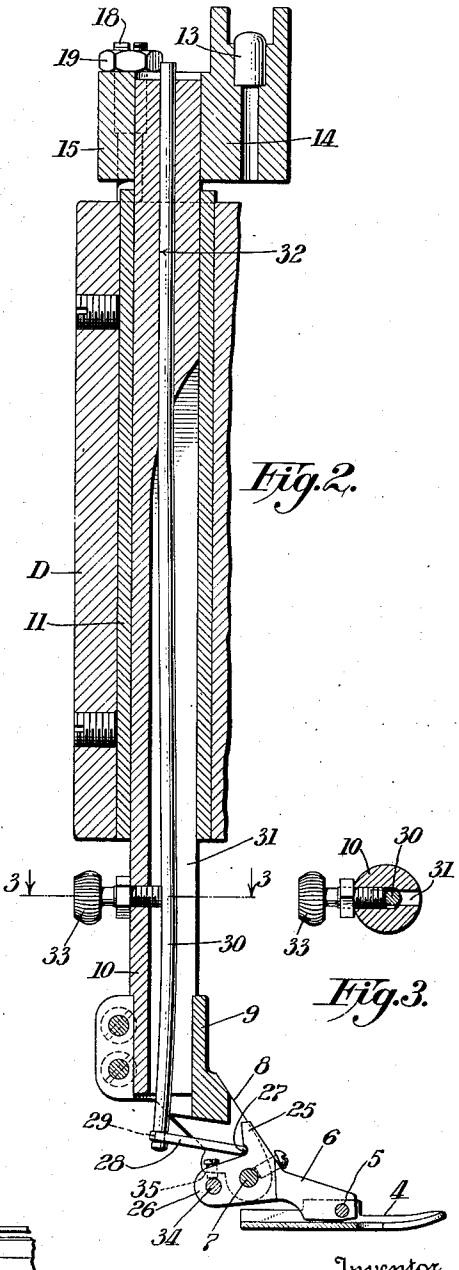



Fig. 2.




Fig. 3.

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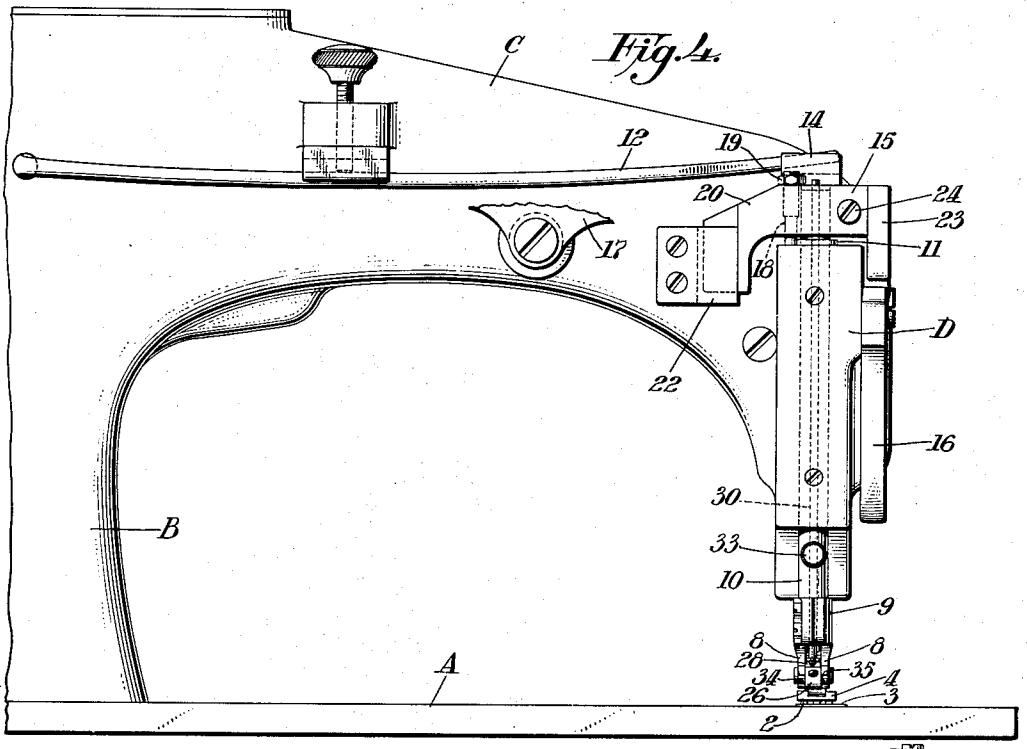
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Filed March 18, 1938 2 Sheets-Sheet 2

Fig. 4.



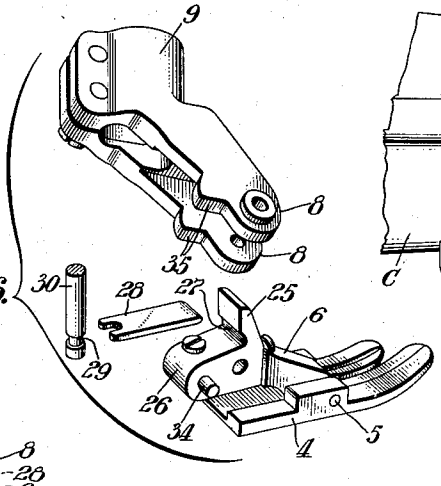




Fig. 6.

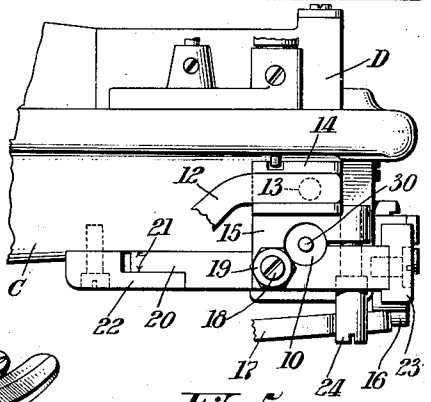



Fig. 5.

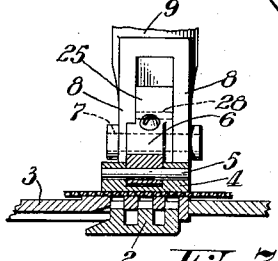



Fig. 7.

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# UNITED STATES PATENT OFFICE

2,161,141

## PRESSER MECHANISM FOR SEWING MACHINES

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Application March 18, 1938, Serial No. 196,643

12 Claims. (Cl. 112—235)

This invention relates to presser-mechanism for sewing machines and has for an object to provide a presser-mechanism which will effectively cooperate with a four-motion feed-dog to feed the work at high operative speeds.

The usual four-motion feed-dog of a sewing machine is opposed by a presser-foot carried by a downwardly spring-pressed presser-bar. When the feed-dog rises through the slotted throat-plate in the bed of the machine, it grips the work against the presser-foot and actually lifts the presser-foot and -bar a short distance during the work-feeding stroke of the feed-dog. At the end of its work-feeding stroke the feed-dog drops below the top surface of the throat-plate and the presser-foot and -bar drop with the feed-dog until the down-movement of the work is arrested by the throat-plate. The work then remains stationary while the feed-dog returns below the level of the throat-plate to its initial position ready to begin another feeding stroke. These engagements of the feed-dog with the work occur once for each stitch made by the machine, and the presser-bar and foot must rise and fall with the feed-dog once for each stitch.

As sewing machine speeds are pushed higher and higher, it becomes increasingly difficult to provide spring-pressed presser-mechanism which will follow the rapid up-and-down movements of the feed-dog and effectively cooperate with the feed-dog to feed the work. Increasing the spring-pressure upon the usual presser-bar has been tried but, at high speeds, this method of overcoming the difficulty puts too great a load upon the feeding mechanism and causes the feed-dog teeth to injure or cut the work.

According to the present improvement, in its preferred embodiment, the presser-foot is carried by a small and light weight pivoted lever which is biased preferably by an adjustable vertically disposed cantilever spring housed in a cavity in the presser-bar. The presser-bar may be lifted, as usual, for insertion and removal of work but remains stationary during the normal cooperative work-feeding movements of the feed-dog and presser-foot. A cantilever spring is found to be highly responsive to speed requirements and, according to the present improvement, a spring may be used which is stout enough to cause the light weight presser-foot and carrier lever to effectively follow the feed-dog at speeds of the order of 8000 to 9000 stitches per minute, without loss of control of the work and without damaging work of fine texture, such as crepes and chiffons.

In the accompanying drawings, Fig. 1 is an end elevation of the gooseneck of a sewing machine embodying the invention. Fig. 2 is a vertical section taken longitudinally of the presser-bar shown in Fig. 1. Fig. 3 is a section on the line 3—3, Fig. 2. Fig. 4 is a rear side elevation of the gooseneck. Fig. 5 is a top plan view of the head at the free end of the gooseneck. Fig. 6 is a disassembled perspective view of the presser-foot and its carrier and parts associated therewith, and Fig. 7 is a transverse sectional view through the pressure-foot and feed-dog of the machine.

The sewing machine is constructed with a frame including the bed A from which rises the standard B of the overhanging gooseneck C terminating at its free end in the head D. The machine has stitch-forming mechanism including the reciprocatory needle 1 and work-feeding mechanism including the four-motion feed-dog 2 which rises and falls through the slotted throat-plate 3 and has feed-and-return movements above and below the level of the top surface of the throat-plate.

Opposed to the feed-dog 2 is the presser-foot 4 which is pivoted on the pin 5 carried by the lever-arm 6 having fixed thereto a pivot-pin 7 journaled in bearings in the arms 8, 8 of the bracket 9 clamped to the presser-bar 10 mounted for vertical sliding movement in a sleeve 11 fixed in the gooseneck head D. The presser-bar is pressed downwardly by the usual leaf spring 12 which bears upon a hardened pressure button 13 set in a socket in an offset portion 14 of a split block 15 clamped upon the upper end of the presser-bar 10.

The presser-bar 10 and foot 4 may be lifted for insertion and removal of work, by operation of the usual hand-operated cam-lever 16 or treadle-operated lever 17. When the presser-foot is lowered to engage the work, the down-motion of the presser-bar 10 is limited by engagement of the adjustable stop-screw 18 with the machine frame. This stop-screw 18 is threaded into the block 15 and is locked in adjusted position by the lock-nut 19. The block 15 has a guide arm 20 integral therewith, which guide-arm works in a guideway 21 between the bracket-arm C and a cheek-piece 22 screwed thereto. Thus, the presser-bar 10 is held from turning in its bearing sleeve 11. The hand-operated cam-lever 16 engages the block 23 screwed to the block 15, while the treadle-controlled lever 17 engages the elongated head of the clamp-screw 24 by

which the split block 15 is clamped upon the presser-bar.

The lever-arm 6, which pivotally carries the presser-foot 4, has formed integral therewith an upstanding arm 25 and a rearwardly extending arm 26. The upstanding arm 25 has in its rearward face a transverse groove 27 which receives the forward end of a strut or thrust-member 28 the notched rearward end of which engages the necked lower end-portion 29 of a cantilever spring 30 which is housed in a cavity or slot 31 in the presser-bar 10 and at its upper end is anchored in a hole 32 formed in and axially of the presser-bar above the slotted portion thereof.

The force of the spring 30 upon the strut 28 may be adjusted by manipulation of the adjusting screw 33 which is threaded into the presser-bar 10 and bears upon the spring 30 between the ends of the latter.

When the presser-bar 10 is lifted for insertion or removal of work, the motion of the lever-arms 6 and 25 imparted thereto by the strut 28 and spring 30 is limited by engagement of the cross-pin 34 in the lever-arm 26 with the stop-shoulders 35 on the arms 8 of the bracket 9.

It will be seen that, by the means described, the movable parts 6, 26 of the presser-mechanism between the foot 4 and spring 30, may be made light in weight, so that they will quickly respond to the force of the spring 30 when the feed-dog 2 is falling below the throat-plate 3. Also the spring 30 is so supported and disposed of that it may be readily made strong enough to secure an ample working pressure of the presser-foot upon the work and feed-dog.

The presser-foot 4, being carried by a pivoted lever, is perfectly free to rise under the lifting influence of the rising feed-dog 12, by the pivotal movement of the lever-arm 6 in the arms 8 of the bracket 9. There is no cramping tendency of any of the parts in such lifting movement.

By the means described, a spring of adequate force is brought to bear upon a vertically movable presser-foot with intervening moving parts of minimum inertia. Thus a presser-mechanism is provided which is responsive to a four-motion feed-dog working at higher speeds than have heretofore been successfully used.

The spring 12 is, of course, strong enough to hold the stop-screw 18 in continuous engagement with the frame-head D, during the feeding operation of the mechanism. In other words, the presser-bar 10 remains stationary and does not vibrate vertically with the presser-foot 4 and feed-dog 2.

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

1. In a presser-mechanism for sewing machines, a spring-pressed presser-bar, a stop to limit the down movement of the presser-bar under its spring, a lever pivotally carried by said presser-bar, a presser-foot carried by said lever, and a cantilever spring carried by said presser-bar and acting upon said lever to bias the presser-foot toward the work.

2. In a presser-mechanism for sewing machines, a presser-bar, means to hold said presser bar stationary at a predetermined operative position, a presser-foot carried by and movable relative to said presser-bar, a cantilever spring carried by said presser-bar to bias the presser-foot in one direction, and an adjusting screw carried by said presser-bar and bearing upon said spring between the ends of the latter.

3. In a presser-mechanism for sewing machines, a hollow presser-bar, a lever pivotally carried by said presser-bar, a presser-foot carried by said lever, and a cantilever spring housed in said presser-bar and arranged to bias said lever in one direction relative to said presser-bar.

4. In a presser-mechanism for sewing machines, a presser-bar having a cavity extending longitudinally thereof, a lever pivotally carried by said bar at one end of said cavity, a presser-foot carried by said lever, a cantilever spring housed in said cavity and fixed at one end to said presser-bar, and an operative connection between the other end of said spring and said lever.

5. In a presser-mechanism for sewing machines, a presser-bar having a cavity extending longitudinally thereof, a lever pivotally carried by said bar at one end of said cavity, a presser-foot carried by said lever, a cantilever spring housed in said cavity and fixed at one end to said presser-bar, a connection between the other end of said spring and said lever, and means to adjust the working force exerted by said spring upon said lever.

6. A hollow presser-bar, a tubular bearing in which said presser-bar is endwise slidably mounted, a presser-foot mounted on one end of said presser-bar for movement relative to said presser-bar, and a cantilever spring housed in and anchored at one end to said presser-bar and connected at its free end to move said presser-foot in one direction relative to said presser-bar.

7. In a sewing machine, a frame, a spring-pressed hollow presser-bar, means to lift the presser-bar, an adjustable stop to limit the down movement of said presser-bar, a lever pivotally carried by said presser-bar, a presser-foot carried by said lever, and a spring housed in said presser-bar and arranged to bias said lever in one direction relative to said presser-bar.

8. The combination with a four-motion feed-dog, of an endwise slidable presser-bar and a presser-foot supported by and movable relative to said presser-bar and arranged to follow the rising and falling movements of said feed-dog independently of the presser-bar, and a spring to bias said foot downwardly upon the feed-dog during the falling movement of the latter, said spring reacting upon the presser-bar.

9. In a sewing machine, the combination with a frame, a four-motion feed-dog, and a presser-bar, of a presser-foot supported by and having feed-dog-following movements relative to said presser-bar, a presser-foot spring for moving said presser-foot downwardly relative to said presser-bar in response to the falling movement of said feed-dog, a presser-bar spring acting upon said presser-bar to move the latter toward said feed-dog, an adjustable stop engaging said frame to limit the movement of said presser-bar under the influence of said presser-bar spring, and means to lift the presser-bar for insertion and removal of work.

10. In a sewing machine, a frame including a bed, and a gooseneck terminating at its free end in a head, a presser-bar endwise slidably mounted in said head and formed with a cavity extending longitudinally thereof, a bracket fixed to the lower end of said presser-bar, a lever pivotally supported by said bracket, a presser-foot carried by said lever, a cantilever spring disposed in the cavity in said presser-bar and fixed at its upper end to said presser-bar, means at the lower end of said spring to transmit the force thereof to said lever, and means carried by said presser-bar to adjust the force of said spring.

11. In a sewing machine, a four-motion feed-dog, having rising-and-falling and feed-and-return movements, a presser-bar, a lever pivotally carried by said presser-bar, a presser-foot carried by said lever, a spring carried by said presser-bar and acting upon said lever to bias the latter in a direction to move the presser-foot toward the fed-dog during the falling movements of the feed-dog, and means to hold the presser-bar against feed-dog-following movements while the feed-dog and presser-foot cooperate to feed the work.

12. The combination with a sewing machine frame having a bed and an overhanging bracket-arm terminating in a head, of a presser-foot pivotally carried below the lower end of said head for rising and falling movements, a vertically disposed cantilever spring anchored at its upper end in said head and terminating at its lower free end adjacent said presser-foot, and an operative connection between the lower end of said spring and said presser-foot, whereby the rising movement of the presser-foot is opposed by said spring.

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