

June 21, 1955

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2,711,145

FEED REGULATING MEANS FOR A SEWING MACHINE

Filed Feb. 25, 1952

3 Sheets-Sheet 1

Fig. 1.

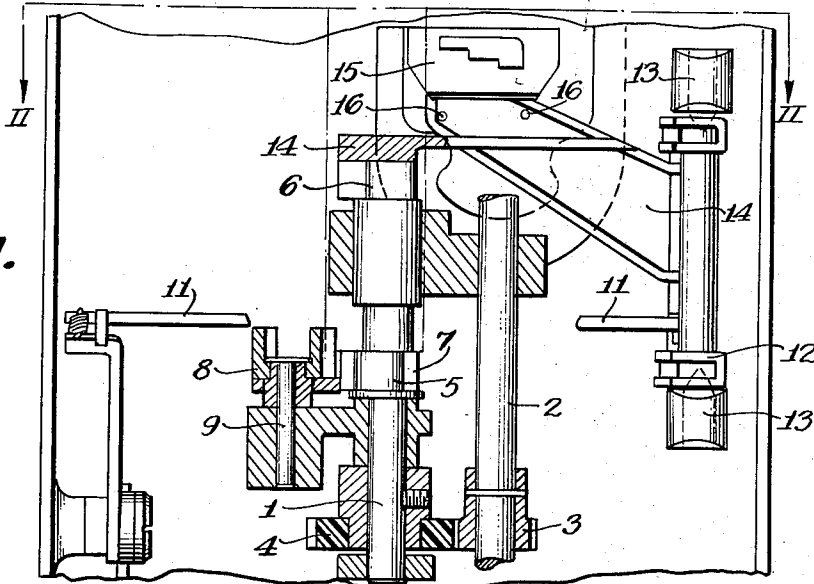


Fig. 2.

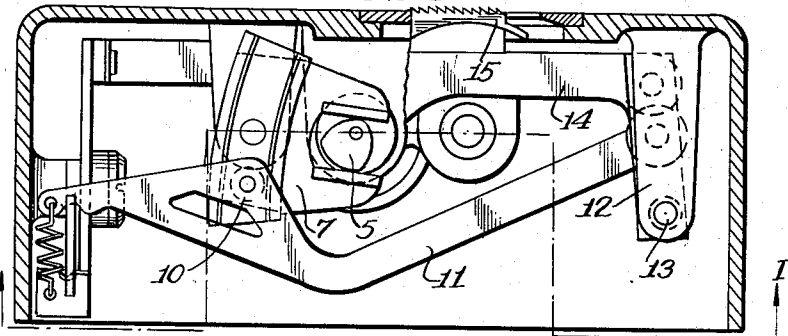
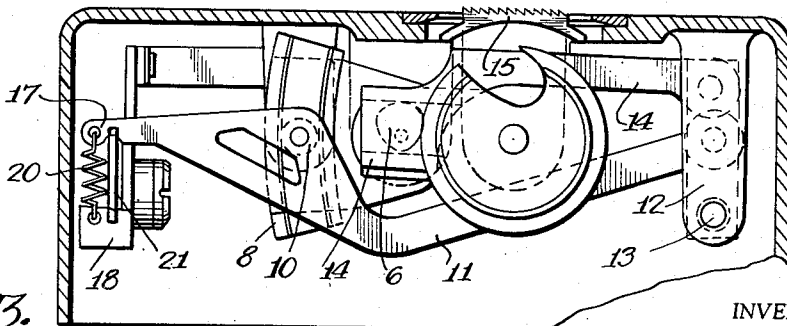


Fig. 3.



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3 Sheets-Sheet 2

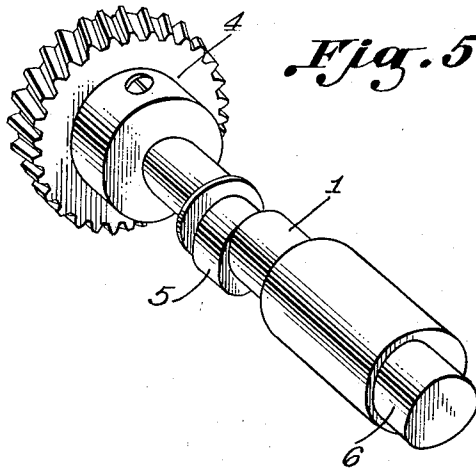


Fig. 5.

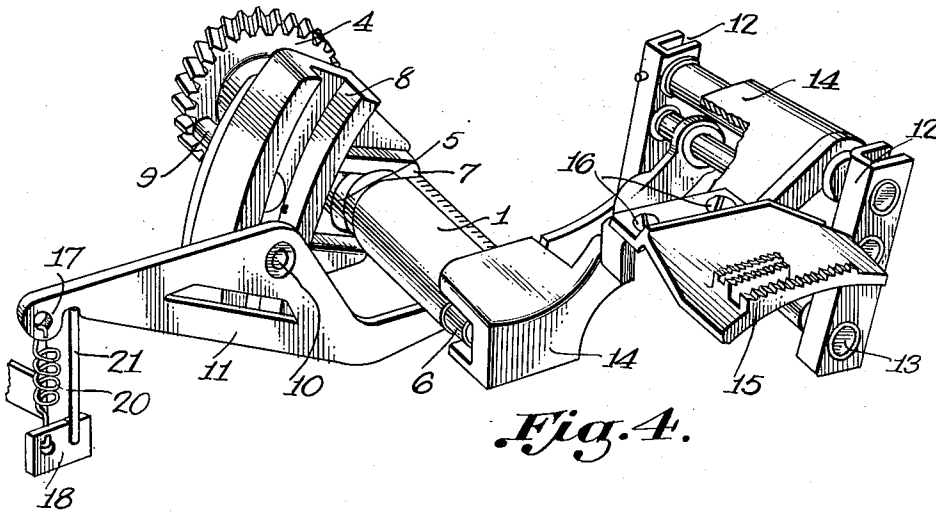


Fig. 4.

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3 Sheets-Sheet 3

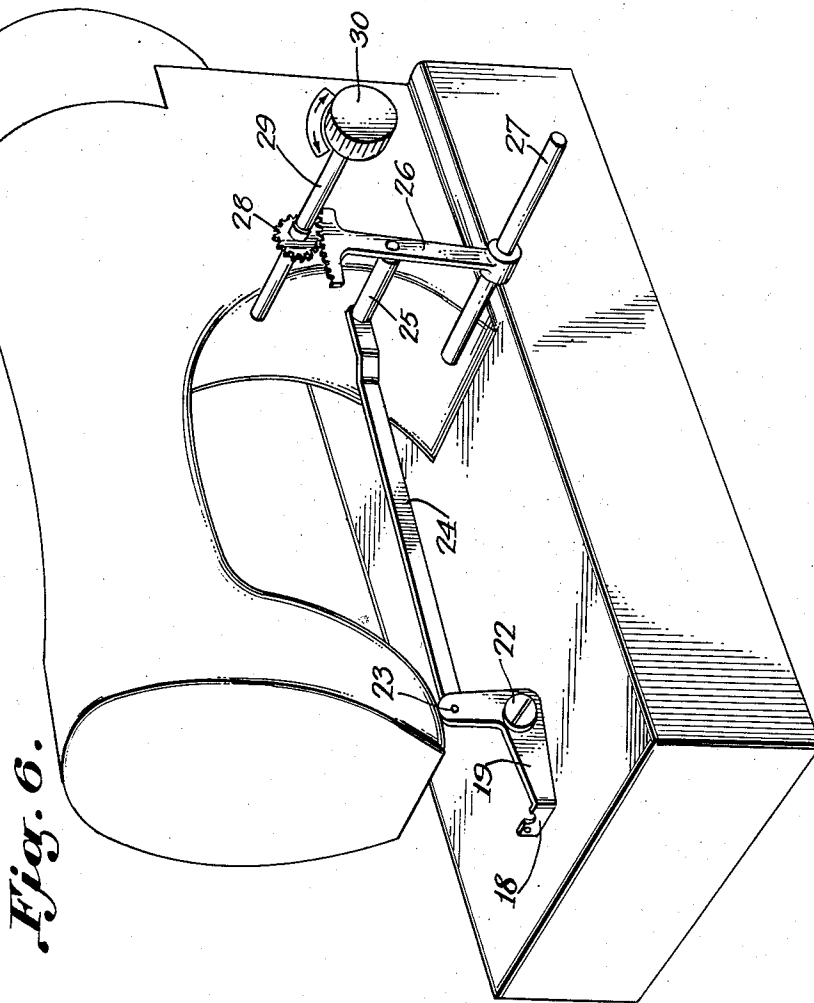


Fig. 6.

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2,711,145

FEED REGULATING MEANS FOR A SEWING MACHINE

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Application February 25, 1952, Serial No. 273,305

Claims priority, application Italy January 25, 1952

2 Claims. (Cl. 112—210)

In sewing machines the adjustable feed device consists of a feed dog which is vertically reciprocated by an eccentric or other equivalent element and is further horizontally reciprocated by the same or another eccentric. When the eccentrics are two in number, these two reciprocating movements can be independent of each other and in particular it is possible to have the feed dog perform four successive and distinct movements, that is rising, moving forwards, sinking and moving backwards; in other words, each point of the feed dog can follow a rectangular path representing the most advantageous solution for carrying out the cloth feed.

In rotating hook machines, since the main undershaft actuating the hook performs two revolutions at each stitch forming cycle, horizontal reciprocation is generally obtained by an eccentric keyed on the upper shaft, which generally performs one revolution at each stitch. In order to eliminate such eccentric and the relative connecting rod, different solutions have been proposed in which the drive of the feed is entirely located in the bottom part of the machine, but these solutions are considerably complicated.

According to the present invention, the horizontal movement of the feed dog is actuated by a connecting piece driven by a slotted link rocking on its central point in a vertical plane parallel to the plane in which the feed dog moves, the point of connection between said connecting piece and said link being displaceable for regulating the stitch length forwards and backwards.

A preferred embodiment of the mechanism is constituted by a short shaft rotating at a speed of one revolution per stitch, driven by the hook shaft and bearing two profiled eccentrics; one of these eccentrics oscillates a slotted link in a vertical plane on a fulcrum placed in its centre, which link, through a slide adjustable in different positions therein, actuates a connecting piece which transmits the oscillation of said link to a member on which a lever is pivoted bearing the feed dog and provided with a slot in which the second profiled eccentric works for oscillating said lever in a vertical direction.

The end of said connecting piece is connected to members adapted to displace the same so as to change the position of the slide in the slotted link to obtain the desired stitch length forwards or backwards.

Fig. 1 is a bottom view of a part of a sewing machine base containing said feed mechanism, through the line I—I of Fig. 2, in a position of backward feed.

Fig. 2 is a section view through line II—II of Fig. 1.

Fig. 3 is an elevational view of the device in a position where there is no feed of the fabric, for an observer placed in front of the hook. Fig. 4 is a perspective view of the device, the base and the supporting parts connected therewith being eliminated.

Fig. 5 is a detail of Fig. 4 and

Fig. 6 is a perspective view of the members controlling the stitch length variation.

The device as shown is composed of the short shaft

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1 supported by the base and taking its rotational movement from hook shaft 2 through gears 3 and 4.

Said short shaft 1 bears two eccentrics 5 and 6 profiled as shown in the drawing.

5 The first of said eccentrics actuates, through a fork embracing it, the slotted link 8.

Said link, rocking on a pivot 9 supported by the base, actuates through a slide or small roller 10 located in the slot of the link, a connecting piece 11 hinged to the member 12 and maintained at its other end in an adjustable position in the manner which will be explained hereinafter.

The member 12 is hinged both to the base in 13 and to a lever 14. Said lever bears the feed dog 15, which is connected thereto by two screws 16; said lever is bent downward at its other end and embraces the second eccentric 6 of the shaft 1 mentioned above.

The operation is therefore the following:

20 The link 8 rocks on the pivot 9, being actuated by the fork 7 as well as by the eccentric 5 keyed on the shaft 1 rotating at a speed which is the half of the speed of shaft 2.

25 The rocking link actuates the piece 11 with a reciprocating motion, the length of which increases as far as the small roller 10 is moved away from the axis of the pivot 9.

When the roller 10 is in the position indicated in Fig. 3, that is on the axis of the pivot 9, the reciprocating motion of the piece 11 is annulled.

30 For any other position of the roller 10 in the link 9, as in the position indicated in Fig. 2, the piece 11 is reciprocated and thus oscillates the member 12 on the pivot 13; as a consequence, the lever 14 bearing the feed dog is actuated to perform the feed motion, in this case a backward feed.

The lever 14 extends into a forked end embracing the eccentric 6. The rotation of the eccentric 6 causes a vertical oscillation of the lever 14.

40 The lever 14 bearing the feed dog is controlled both by the piece 12 for a backward and forward movement and by the eccentric 6 for a vertical movement.

The regulation of the stitch length is obtained by displacing the end 17 of the connecting piece 11 and consequently the roller 10 in the slot of the link 8.

45 When the roller is centered on the pivot 9 of the link no stitch length is obtained; ever increasing stitch lengths from zero to the maximum stitch length, either forward or backward, are obtained by moving the roller 10 away from the axis of the pivot 9, respectively upward or downward.

50 The displacement of the end 17 of the piece 11 is obtained through the mechanism illustrated in Fig. 6.

55 The end 17 of the piece 11 is connected to the end 18 of a crank lever 19 through a spring 20 and a distance piece 21 (Figs. 2 and 3); the tension of the spring 20 keeps the piece 21 engaged between the ends 17 and 18 of pieces 11 and 19.

A double cardan joint is thus realized between said ends of 11 and 19.

60 The lever 19 is hinged at 22 on the machine base; the other end 23 of the lever 19 is hingedly connected with one end of the bar 24 which at its other end is hinged on the spindle 25 fixed to a gear sector 26 hinged on the long pivot 27 and driven by the pinion 28. This pinion 28 is fixed on a shaft 29 which can be rotated by the knob 30; the latter constitutes thus the control member for the variation of the feed pitch and can be realized for example in the manner described in the copending application Serial number 273,306 filed February 25, 1952.

70 In the example illustrated in the drawings, the slotted link is curved and its centre of curvature is on the axis

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of the hinge between the pieces 11 and 12; said link, however, can also be straight or else have a curvature opposite to that represented in the drawings and that with the purpose of ensuring a more accurate feed of the cloth (as it may be advantageous in determined cases) thus obtaining that, when the reciprocations of the feed dog are smaller, they take place in a zone nearer to the needle.

What I claim is:

1. Feed regulating means for a sewing machine comprising a base, a hook shaft supported by said base, a second shaft supported by said base and driven by said first mentioned shaft at a speed of one revolution at each stitch, a pair of cams on said second shaft, a link having a slot therein pivoted on said base at its middle point for oscillation in a vertical plane, means on said link cooperating with one of said cams to oscillate said link, a slide movable in said slot to both sides of said middle point, a member pivoted on said base, a connecting piece hinged on said member and on said slide, means for adjustably displacing said slide in said slot, a lever pivoted on said member, means on said lever cooperating with the other of said cams for oscillating said lever vertically and a feed dog fixed on said lever.

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2. Feed regulating means for a sewing machine comprising a base, a shaft supported by said base and driven at a speed of one revolution at each stitch, a pair of cams on said shaft, a link having a slot therein pivoted on said base at its middle point for oscillation in a vertical plane, means on said link cooperating with one of said cams to oscillate said link, a slide movable in said slot to both sides of said middle point, a member pivoted on said base, a connecting piece hinged on said member and on said slide, means for adjustably displacing said slide in said slot, a lever pivoted on said member, means on said lever cooperating with the other of said cams for oscillating said lever vertically and a feed dog fixed on said lever.

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