May 10, 1932. C. W. MUELLER 1,857,692

TOP FEEDING MECHANISM

Original Filed Aug. 26, 1927 3 Sheets-Sheet 1

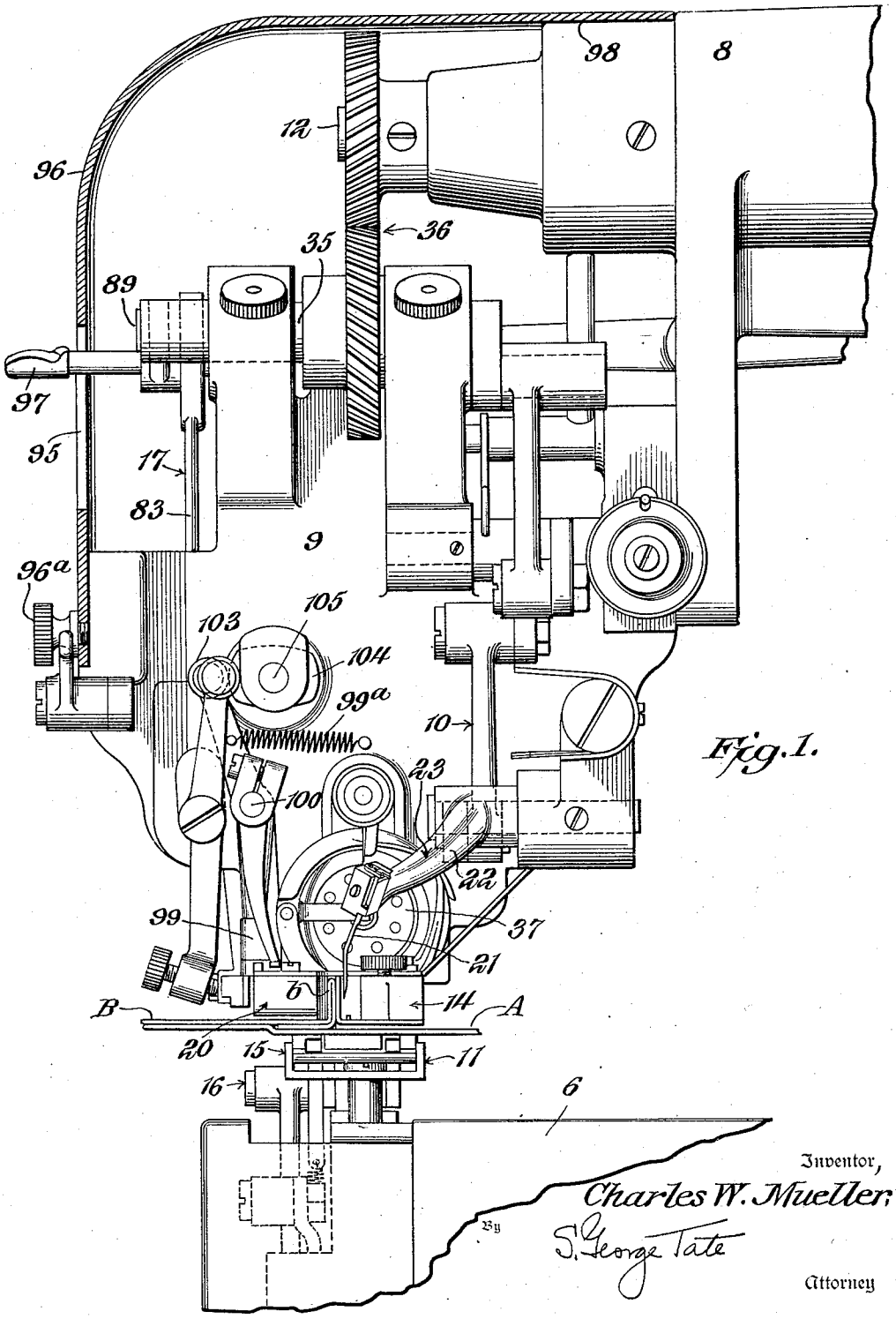



Fig. 1.

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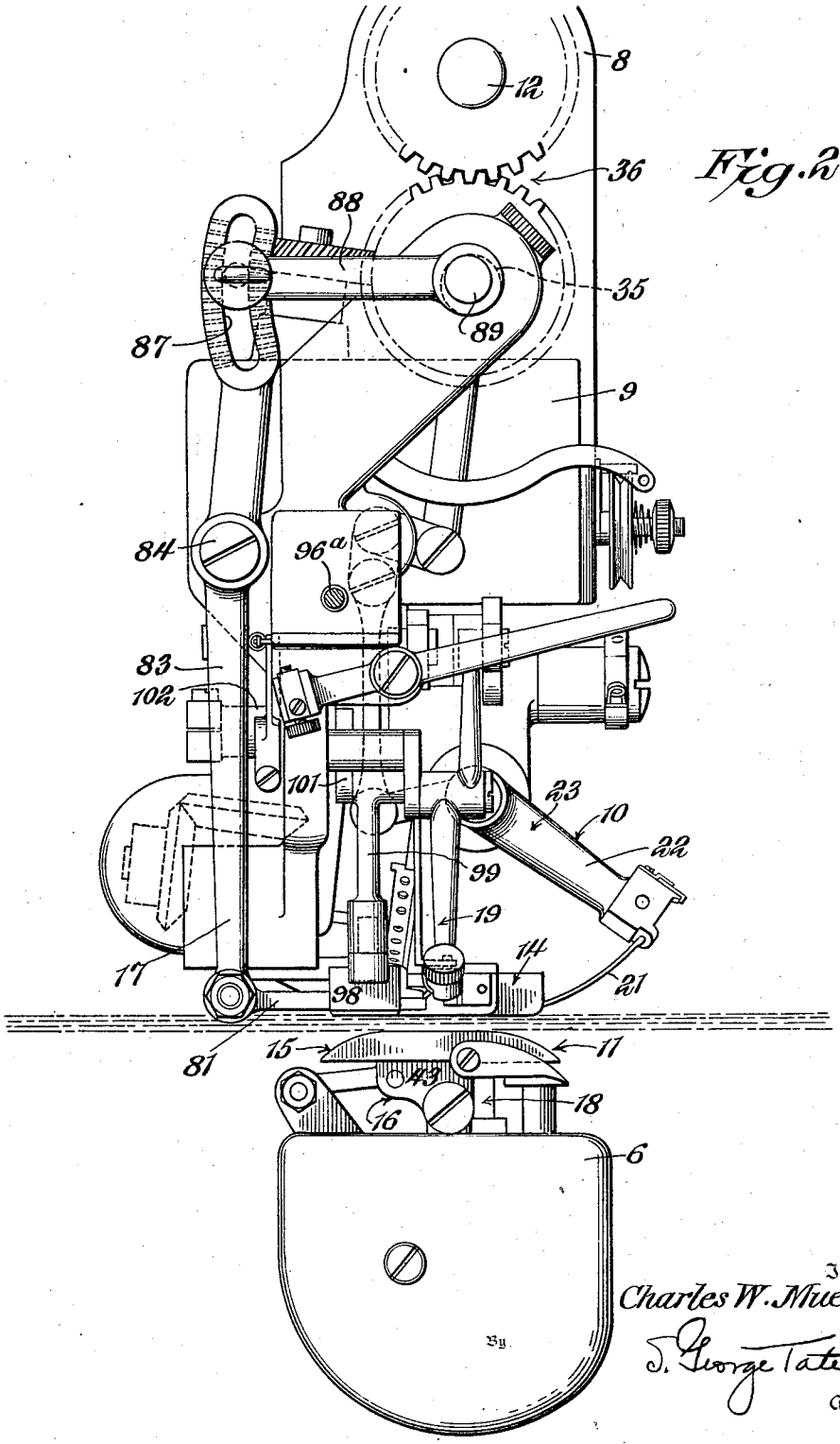



Fig. 2.

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TOP FEEDING MECHANISM

Original Filed Aug. 26, 1927 3 Sheets-Sheet 3

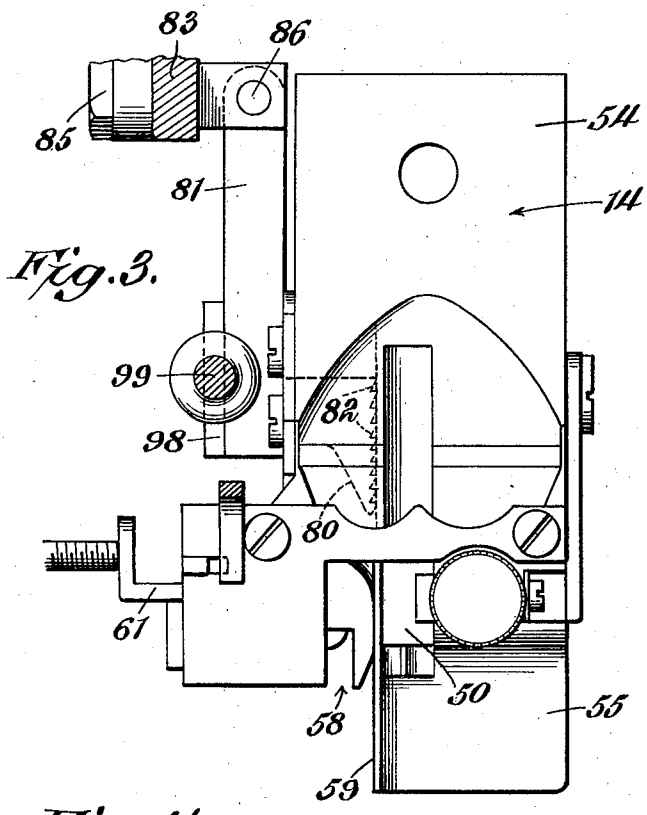



Fig. 3.

Fig. 4.

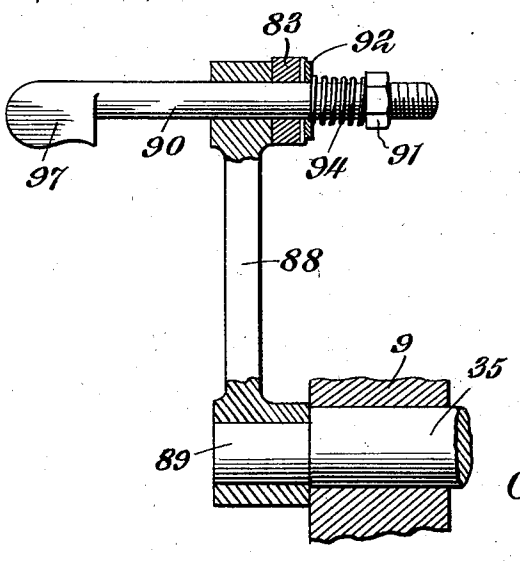
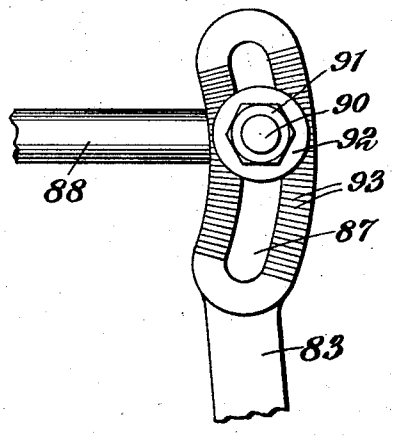



Fig. 5.




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# UNITED STATES PATENT OFFICE

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## TOP FEEDING MECHANISM

Original application filed August 26, 1927, Serial No. 215,701. Divided and this application filed March 27, 1929. Serial No. 350,218.

This invention relates to new and useful improvements in top feeding mechanisms for blind stitch felling machines which are especially adapted for felling a superposed layer upon a base layer of material.

The present invention is a divisional application of my application filed Aug. 26, 1927, Serial No. 215,701, for lining felling machines.

The machine which embodies my present invention is particularly intended for use in felling the edges of coat linings to the body of the garment, the line of blind stitches connecting the superposed lining or layer and the base layer or body fabric, being disposed at a considerable distance from the infolded edge of the lining and extending parallel with said infolded edge whereby the infolded edge portion or lining may afterwards be pressed down onto the base layer and thereby cover the line of blind stitches.

I first superpose a coat lining on the body fabric, then infold the marginal edge portion of the lining, and then secure said infolded edge portion to the body fabric along a line extending parallel with the folded edge and at a considerable distance therefrom. The assembly is then fed through the machine by my improved feeding mechanism with the folded edge portion extending upwardly in a plane at right angles to the body fabric.

The principal object of the present invention is to provide a work presenting mechanism which includes a top feed mechanism for engaging and feeding the upturned marginal edge portion of the superposed layer past the stitch forming mechanism, a cover for the top feed mechanism and manually operable means which project through the cover for quickly varying the feed stroke of the top feed mechanism without the necessity of removing the cover.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is an enlarged front elevation of the stitching head and work support of a sewing machine embodying the subject matter of my invention,

Figure 2 is an end elevation thereof, the cover being removed,

Figure 3 is an enlarged top plan view of the main presser foot showing the relation of the upper feed dog thereto,

Figure 4 is a detailed sectional view showing the adjustable connection in the top feed mechanism for varying the feed stroke of the top feed dog, and

Figure 5 is a detailed elevation showing the upper end of the feed lever and the adjustable link connection therewith.

Like reference numerals designate corresponding parts throughout the several figures of the drawings.

The present invention is illustrated herein as embodied in a blind stitch sewing machine of the "Lewis" type, and comprises a laterally extending work arm 6, an overhanging arm 8, and a stitching head 9 which is secured to the free end of the overhanging arm and is disposed above the outer end of the work arm.

The machine includes a stitch forming mechanism which I have indicated as a whole by the reference numeral 10, and a work presenting mechanism which I have indicated as a whole by the reference numeral 11. Both the stitch forming mechanism 10 and the work presenting mechanism 11 are operated from a main rotary shaft 12 which extends longitudinally of the overhanging arm 8 through the medium of driving connections illustrated in my copending application referred to above.

The work presenting mechanism consists of a main presser foot 14 which is fixed to the stitching head 9, a work clamp 15 which cooperates with the work below the main presser foot, a lower feeding mechanism 16, an upper feeding mechanism 17, a lower plunger mechanism 18, and a movable presser foot 20.

The needle mechanism 10 includes a reciprocatory non-shogging needle 21 having

its path of movement in a single plane parallel with the line of feed. The needle 21 is secured to the arm 22 of a needle lever 23 which is fulcrumed on the stitching head 9 and is oscillated from the main rotary shaft 12 through the medium of suitable driving connections. Cooperating with the needle 21 is a rotary hook 37 and this hook is given two revolutions to each reciprocation of the needle. The hook is rotated from the main driving shaft 12 through the medium of suitable driving connections.

The main presser foot 14 is fixedly secured to the lower portion of the stitching head 9 and cooperating with the underface of said foot is the work clamp 15, the lower feed mechanism 16, and the lower plunger mechanism 18.

The lower feeding mechanism 16 includes a feed dog 43 which is of the 4-motion type and the mechanism for operating this feed dog is substantially identical with that shown in my former Patent 1,588,132, issued June 8, 1926.

The work for which this machine is intended includes a base layer A which may be the body fabric of a coat, and a superposed layer B which may be the lining therefor. The lining B has its marginal edge portion infolded as indicated at *b* and this infolded portion is initially secured to the body fabric A by means of a line of basting stitches. The parts thus joined are fed through the sewing machine forming my invention with the marginal folded portion *b* turned-up into a vertical plane. The base layer A is fed through the machine by the direct contact of the lower feeding mechanism 16 and the upturned marginal folded portion *b* is fed through the machine by direct contact with the upper feeding mechanism 17.

The main presser foot 14 includes a heel 54, a toe 55, and an opening 50 which is located therebetween and through which the plunger mechanism 18 projects a node of the base layer upwardly for engagement by the needle 21. The toe 55 is provided with a longitudinally extending guideway 58 for the upturned folded portion *b* of the lining. This guideway extends in the line of feed and includes a vertical wall 59 which is carried by the toe 55, the wall extending in the line of feed and being disposed on the right hand side of the guideway 58. Located on the left hand side of the guideway 58 is the movable presser foot 20 and slidably mounted in this presser foot 20 is a horizontally movable upper plunger 61 which in one direction of its movement projects a node of the upturned marginal portion *b* into the path of the needle 21.

As above stated, the upper feeding mechanism 17 co-operates with the lower feeding mechanism 16 to feed both the upper and lower layers of material in unison. This upper feeding mechanism includes a feed dog 80 which is fixed to a feed bar 81. The feed dog 80 is provided with a series of fabric engaging teeth 82, and this dog is mounted for feeding movements in a horizontal plane, that is, the feeding movements of the upper feed dog are in a plane at right angles to the feeding movements of the lower feed dog, and the feeding surfaces of said dogs are in vertical and horizontal planes respectively. The upper feed dog 80 cooperates with the rear portion of a guiding wall 59 which extends in rear of the movable presser foot 20. Four motions are imparted to the feed dog 80, that is, back and forth and in and out, the back and forth movements being in the line of feed whereas the in and out movements are in a plane transverse to the line of feed. The feeding movements of the feed dog 80 are in unison with the feed movements of the lower feed dog 43. In order to reciprocate the upper feed dog 80 forwardly and backwardly, I have provided a vertically extending lever 83 which is fulcrumed on a horizontal axis 84 on the rear face of the stitching head 9 and the lower end of the lever 83 being pivotally connected to the feed bar 81 by right angle connections 85—86, the former being a horizontal pivot and the latter being a vertical pivot. The upper end of the lever 83 is provided with a segmental slot 87 having an adjustable connection with one end of a pitman or link 88, the other end of the pitman being connected to an eccentric pin 89 fixed to a shaft 35 which is driven from the main shaft 12 through the medium of a gear coupling 36. This adjustable connection includes a horizontal pin 90 which is fixed to the link or pitman 88. One end of the pin extends through the segmental slot 87 and carries a nut 91. A clamp disc 92 has its inner face knurled for engagement with the roughened face 93 of the lever 83. A coil spring 94 is disposed intermediate the disc 92 and the nut 91 and serves to retain the pin 90 in any position of adjustment along the slot 87. The other end of the pin 90 extends through a slot 95 formed in a cover plate 96, and is provided with a finger piece 97. The cover plate 96 encloses the stitch forming mechanism and the top feeding mechanism, and is supported on the stitching head 9 as shown at 98*a*, the cover plate being removably locked to the stitching head by means of a clamping screw 96*a*. Thus the operator may have immediate access to the adjustable connection of the upper feeding mechanism to thereby quickly adjust the feeding stroke of the upper feed dog 80 whenever desired. By means of the adjustable connection, the pin 90 will be retained automatically in any position of adjustment.

In order to impart in and out movements to the upper feed dog 80, I have provided the feed bar 81 with an upwardly extending

slide plate 98. This plate is preferably formed integral with the feed bar 81 and extends longitudinally of said bar. An operating lever 99 has its lower end slotted to form a fork for engaging the slide plate 98. The lever 99 is fulcrumed intermediate its ends on a crank pin 100 fixed to a crank arm 101 mounted on a crank shaft 102 which is journaled in the stitching head 9 with its axis parallel to the line of feed. The uppper end of the operating lever 99 is provided with a cam roller 103 which has direct contact with a peripheral cam 104 fixed to a shaft 105 journaled in the head 9 and driven from the shaft 12 by suitable connections. A spring 99*a* has one end connected to the upper end of the operating lever 99 and the other end connected to the stitching head 9 for yieldably retaining the cam roller 103 in engagement with the cam 104. The cam 104 is formed with opposed high points of equal radius, and inasmuch as the shaft 105 makes one complete rotation to every two complete rotations of the main shaft 12, it will be apparent that the operating lever 99 will be given a complete oscillation during each complete rotation of the main shaft 12.

It is of course to be understood that the details of structure and arrangements of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:

1. In a sewing machine including a stitching head, a top feed mechanism mounted on the head including a feed dog and a lever for imparting feed movements to the dog, and an actuating link adjustably connected to the lever to vary the movement thereof, the combination of a cover removably attached to and embracing the stitching head and the top feed mechanism and provided with a slot in register with the adjustable connection between the actuating link and the feed lever, and manually operable means connected to said adjustable connection and projecting outwardly through the slot of the cover whereby the feed stroke of the lever may be varied without removing the cover or the cover removed without interfering with the manually operable means.

2. In a sewing machine including a stitching head, a top feed mechanism mounted on the head including a feed dog and a lever for imparting feed movements to the dog, and an actuating link adjustably connected to the lever to vary the movement thereof, said adjustable connection including a slot in the lever, a pin carried by the link for engagement in the slot of the lever, means for yieldably retaining the link in any adjusted position along the slot of the lever, the combination of a cover removably attached to and embracing the stitching head and the top feed mechanism and provided with a slot in register with the adjustable connection between the actuating link and the feed lever, and a manually operable arm fixed to the link and projecting outwardly through the slot of the cover whereby the feed stroke of the lever may be varied without removing the cover or the cover removed without interfering with the manually operable means.

In testimony whereof I hereunto affix my signature.

CHARLES W. MUELLER.