Dec. 21, 1943. L. F. REMINGTON 2,337,413

VARIABLE FEED MECHANISM FOR RAILWAY SEWING MACHINES

Filed Aug. 15, 1942 3 Sheets-Sheet 1

Fig. 1.

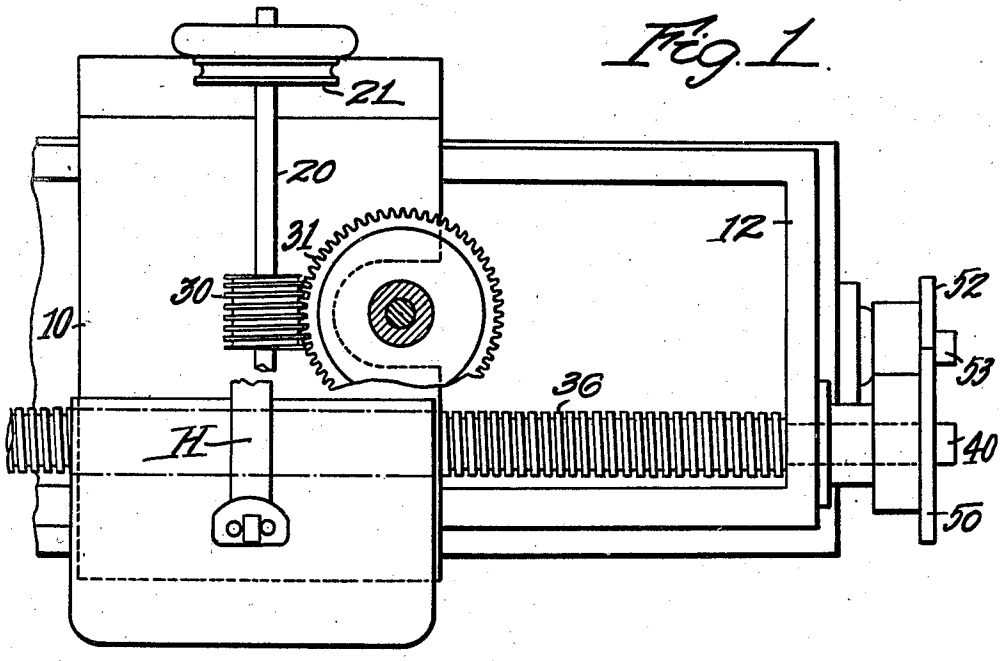
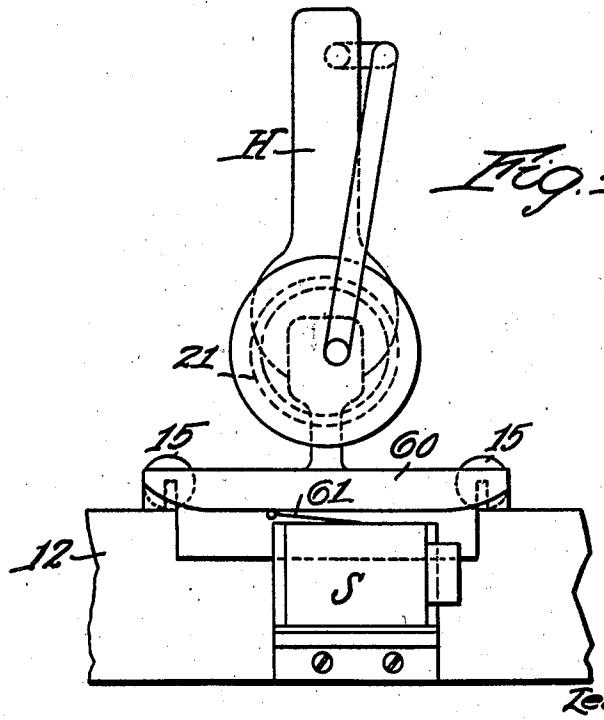


Fig. 4.



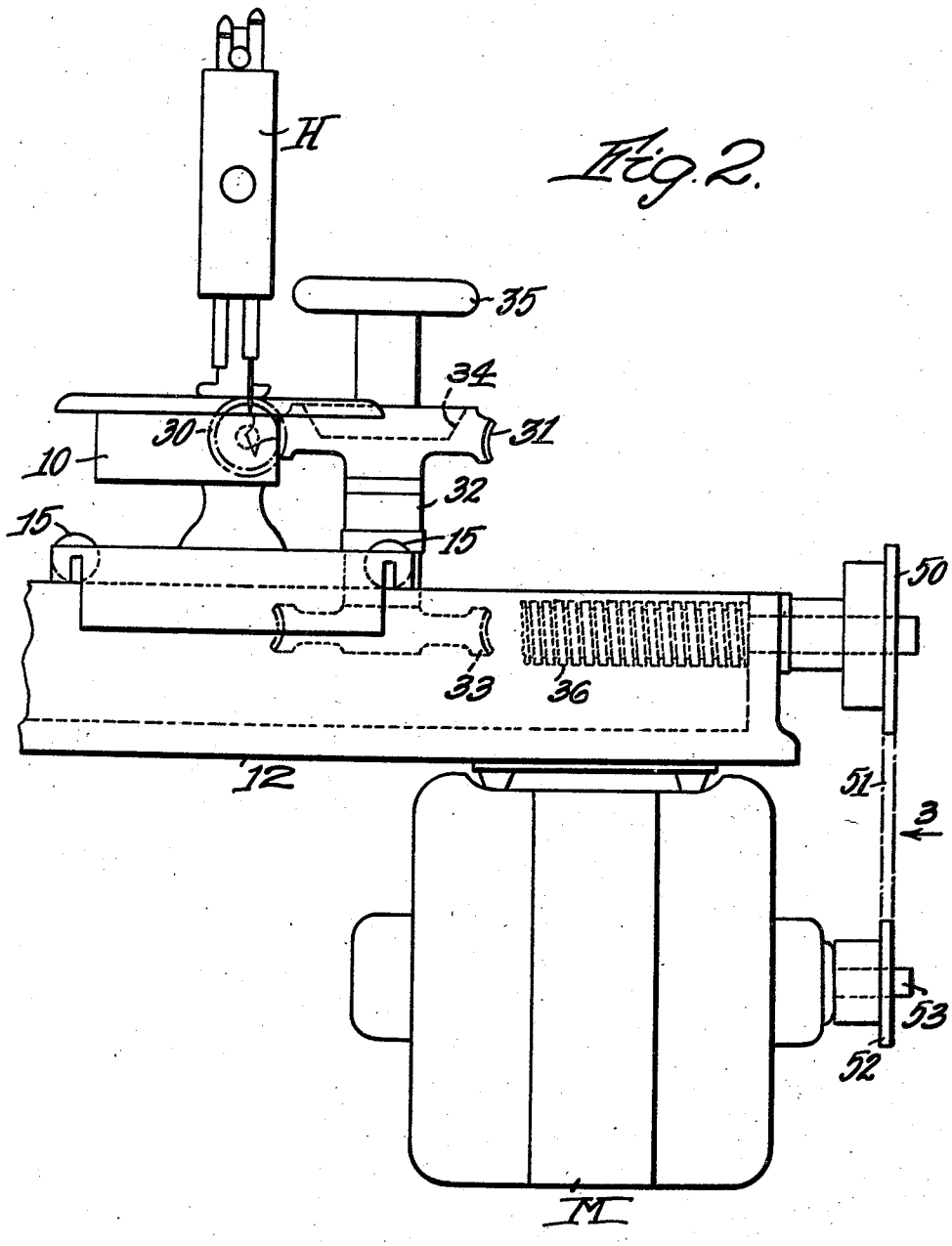
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Fig. 2.



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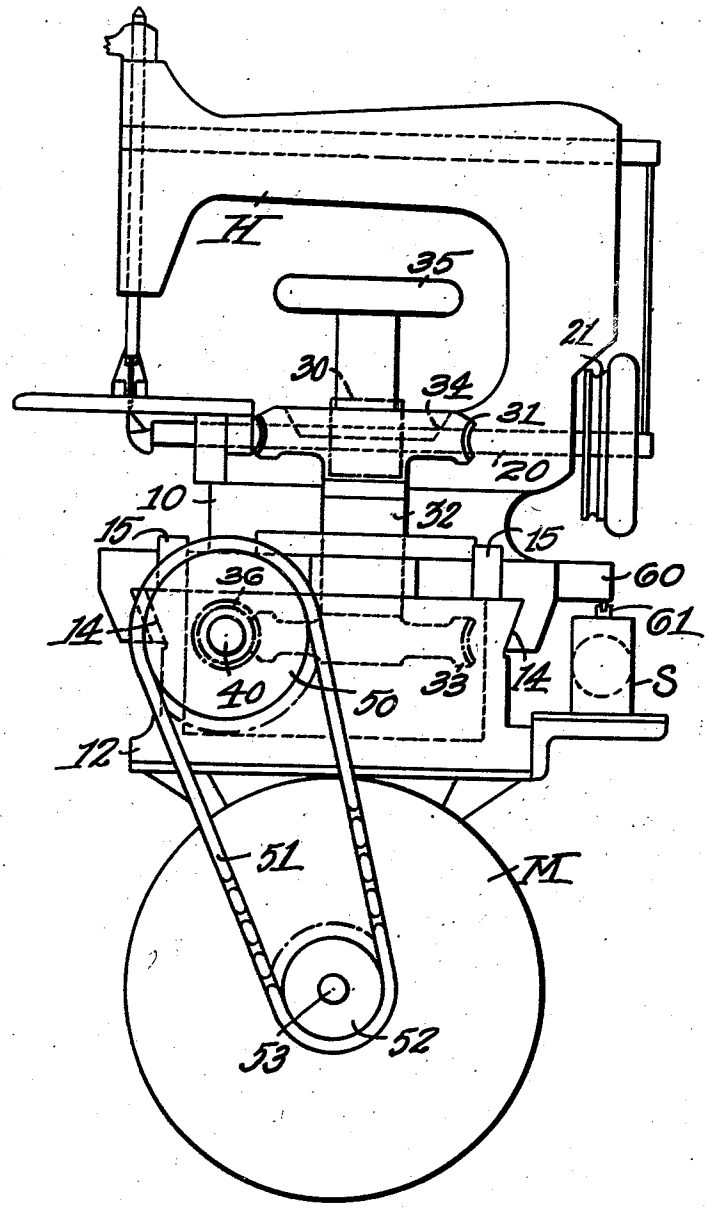


Fig. 3.

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VARIABLE FEED MECHANISM FOR RAILWAY SEWING MACHINES

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Application August 15, 1942, Serial No. 454,938

3 Claims. (Cl. 112—2)

This invention relates to the temporary securing of pieces of cloth together, preparatory to certain textile finishing operations. It is customary to stitch the adjacent ends of successive pieces of cloth together to form a large roll for such operations, and the stitching is commonly performed by a sewing machine of the railway type which is moved bodily transversely of adjacent ends of pieces of cloth and from one selvage edge to the other.

It has been found desirable to increase the number of stitches per inch at the selvages to strengthen the selvage connections and to reduce the chance of having the pieces of cloth tear apart at the stitched portions. This is particularly desirable when using the looped stitches of the Merrow type seam.

It is the general object of my invention to provide an improved variable feed mechanism for a railway sewing machine, by which reenforced selvage portions may be conveniently produced. More specifically, I provide a differential feed for a railway sewing machine which acts in the opposite direction from the regular feed and which reduces but does not reverse said regular feed.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a plan view of portions of a railway sewing machine embodying my improvements;

Fig. 2 is a front elevation thereof;

Fig. 3 is an end elevation, looking in the direction of the arrow 3 in Fig. 2; and

Fig. 4 is a partial rear elevation showing a control switch.

Referring to the drawings, I have shown a sewing machine head H mounted on a carriage 10 slidable on a fixed frame or base 12 having dovetailed guideways 14 (Fig. 3). Rolls 15 may be provided to reduce friction. The sewing machine head H may be of any usual or commercial form and is quite commonly of the so-called "Merrow" type.

The stitching mechanism is driven from a drive shaft 20 by means of a pulley 21 and a suitable chain (not shown), or the shaft 20 may be driven in any other convenient manner.

The shaft 20 is provided with a relatively fine-pitch worm 30 (Fig. 1) which engages a worm wheel 31 which is loosely mounted on an upright shaft rotatable in a bearing 32 on the carriage 10 and having a second worm wheel 33 fixed at its lower end. A friction disc 34 and hand wheel 35 constitute means for locking the worm wheels 31 and 33 in fixed relation to each other. The friction disc 34 is provided so that the worm wheel 31 may be released during the manual return movement of the carriage 10 and head H to the starting point after a seam has been stitched.

The worm wheel 33 meshes with the threads 36 (Fig. 1) on a feed screw 40 mounted in bearings at the ends of the frame or base 12 and held stationary during the normal operation of the railway head. When the screw 40 is thus stationary, rotation of the lower worm wheel 33 causes the worm wheel to roll along the feed screw 40 after the manner of a gear and rack, and the carriage 10 and head H are thus fed transversely of the cloth at the speed desired for regular stitching.

As the sewing machine operates at constant speed and forms a fixed number of stitches each minute, an increase in the number of stitches per inch at the selvages must be attained by reducing the rate of feed of the carriage 10 and head H transversely of the cloth. This is accomplished with my improved construction by rotating the feed screw 40 in a direction which would reverse the travel of the carriage if the worm wheel 33 was held from rotation. But as the worm wheel continues to revolve as before, the effect is differential only, and the rate of rotation of the feed screw 40 may be so selected as to retard but not reverse the carriage travel.

To effect such rotation, I have shown the feed screw 40 as connected by a sprocket 50 and chain 51 to a second sprocket 52 on the armature shaft 53 of a motor M (Fig. 2) mounted below the frame 12. The speed of the motor and the sizes of the sprockets 50 and 52 and the pitch of the feed screw 40 will all be so selected as to give the necessary differential speed to the feed screw 40 to produce the desired increase in stitches at the selvage.

In a machine in which the sewing head made 2880 stitches per minute, the sewing head and carriage traveled at the rate of 30 ft. per minute to insert eight stitches per inch for regular stitching, and with the feed screw stationary. The number of stitches was increased to twelve stitches per inch at the selvages by rotating the feed screw at a speed of 720 R. P. M. in a direction which would have reversed the travel of the carriage if the worm gear were locked. Any other relative increase in stitches per inch could

have been secured by changing the speed of the motor or the ratio of the spockets **50** and **52**.

The starting and stopping of the motor M is preferably controlled automatically by switches S (Figs. 3 and 4) which are closed by a cam block **60** secured to the back of the carriage **10** and engaging a switch arm **61**. The position of each switch S is adjustable along the frame **12** to determine the point at which the increased number of stitches are to be inserted. It will be understood that a separate switch S is provided at each end of the machine.

From the foregoing description, it will be evident that I have provided a very simple and reliable construction by which the number of stitches inserted by a railway sewing machine may be automatically increased at the cloth selvages and by which the normal number of stitches will be automatically restored at selected points. I have also been able to accomplish this desirable result with comparatively small changes in the usual construction of a railway sewing machine.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a railway stitching machine, a stitching head, a movably mounted carriage supporting said head, a constantly rotated shaft in said head, a worm on said shaft, a worm gear mounted in said carriage and engaged by said worm, a second worm gear mounted to rotate with said first worm gear, a normally stationary feed screw engaged by said second worm gear and along which said gear rolls to feed the carriage, means to rotate said feed screw in a direction to differentially reduce but not reverse the effective rolling action of said constantly rotated second worm gear along said feed screw, whereby a relatively slow feed of said head and in the same direction is attained, and automatic means effective to render said feed screw rotating means operative and inoperative at predetermined points in the travel of said carriage and stitching head.

2. In a railway stitching machine, a normally stationary feed screw, means coacting therewith to move the stitching mechanism at a normal rate of feed transversely of the cloth, and means to rotate said feed screw in a direction to reduce but not to reverse said rate of feed by its differential action on said coacting means, said rotating means including a motor to drive said feed screw, control switches for said motor, and automatically engaged devices associated with and movable with said stitching mechanism and effective to selectively close said control switches and start the motor at predetermined points in the travel of said stitching mechanism, whereby a relatively slow feed of said head and in the same direction is attained.

3. In a railway stitching machine, a stitching head, a movably mounted carriage supporting said head, a shaft in said head, means to rotate said shaft at constant speed, a worm gear fixed on and rotated by said shaft at constant speed, a normally stationary feed screw continuously engaged by said worm gear and along which said gear rolls to feed the carriage at normal stitching speed when said gear is constantly rotated, means to rotate said feed screw in a direction to differentially reduce but not reverse the effective rolling action of said constantly rotating worm gear along said feed screw, whereby a relatively slow feed of said head but in the same direction is attained, and automatic means effective to render said feed screw rotating means operative and inoperative at predetermined points in the travel of said carriage and stitching head.

LELAND F. REMINGTON.