

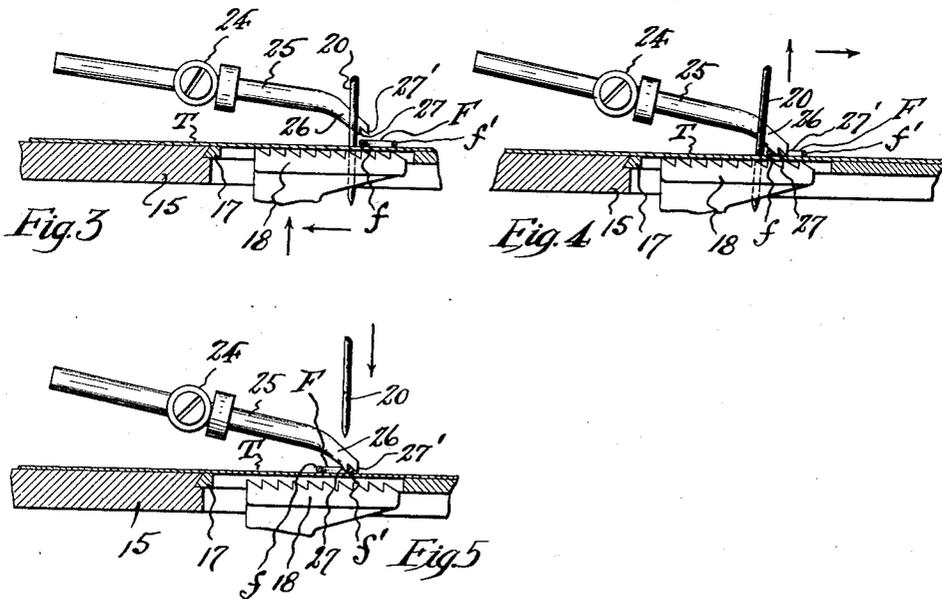
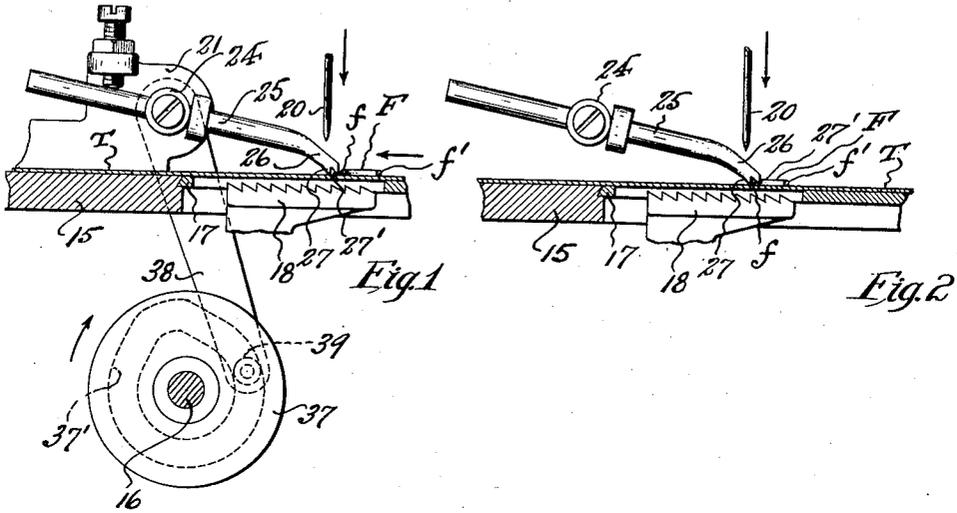
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SEWING MECHANISM FOR STITCHING OVER FASTENER DEVICES

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SEWING MECHANISM FOR STITCHING OVER FASTENER DEVICES

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This invention relates to attachments for sewing machines to adapt the same for stitching over fastener devices, such e. g. as tapé having metallic eye loops thereon; and the present invention has reference, more particularly, to improvements in attachments of the kind shown in my co-pending application for United States Patent Ser. No. 494,525, filed November 10th, 1930.

The present invention has for its principal object to provide an improved stop means engageable by the fastener devices as the latter move up to the needle of the sewing machine, whereby said fastener devices are arrested and held out of the path of the needle preparatory to the sewing of stitches across the metal sides of fastener devices, and whereby at the same time the devices to be sewn across are securely held against displacement from desired relation to the sewing needle under back-pulling strains or stretching of the material on which the devices are carried or on which they are to be sewn, during the manipulation of said material by the operator.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of the present invention is shown in the accompanying drawing, in which:—

Figs. 1 to 5 inclusive are fragmentary cross sectional views through the sewing point of a sewing machine, said views illustrating various stages in the operation of the improved stop means of this invention.

Similar characters of reference are employed in the several views, to indicate corresponding parts.

Referring to said drawing, the reference character 15 indicates the sewing table or bed plate of any suitable type of sewing machine, beneath which extends the drive

shaft 16 of the machine, from which the sewing mechanism thereof is driven in the well known manner, and also from which the fastener stop mechanism is actuated. The sewing mechanism includes the usual throat-plate 17, which is slotted to permit the feed-dog 18 to rise therethrough, so that the work to be stitched is gripped between the same and the usual spring tensioned presser foot (not shown), whereby the work is advanced by the intermittent movement of the feed-dog according to the stitch to be produced. Other forms of work feeding means may be employed, if desired. The sewing mechanism also includes a vertically reciprocable sewing needle 20 to cooperate with shuttle means (not shown) in forming the stitches. The sewing needle is preferably of the well-known oscillating or walking type, which after penetrating the work advances therewith, and when withdrawn from the work is swung back to initial position to carry the sewing thread over the work for the completion of a stitch by the succeeding descent of the needle. Other forms of sewing needle movements may be employed however, such e.g. as the straight or vertically reciprocated needle, which is non-oscillatory.

The novel stop means of the present invention, comprises a bearing bracket means 21, which is secured to the bed-plate 15 adjacent to but preferably rearward of the sewing mechanism. Journaled in said bearing bracket means 21 is a rock-shaft 24 extending at right angles to the direction of movement of the work fed across the sewing mechanism of the machine. Extending through the end of said rock-shaft 24, at right angles to the axis thereof, and consequently parallel to the direction of movement of the work fed across the sewing mechanism of the machine, is a stop arm 25, the same having a downwardly pitched free end portion 26, at the extremity of which are a pair of spaced stop-

fingers, comprising a main fastener positioning stop-finger 27 and an auxiliary stop-finger 27' outwardly spaced from and in advance of said main stop-finger 27.

5 Means are provided for actuating the stop arm 25 synchronously with each stitch-forming operation of the sewing mechanism, but in such timed relation to the feeding movement of the latter as to operatively lower  
10 the stop-arm to dispose the main stop finger 27 in fastener arresting position prior to the descent of the needle by which each stitch forming operation is begun, and so as to  
15 raise the stop-arm to release the stop-finger 27 from fastener arresting position to permit forward feeding movement of the work and the fastener being sewn over. The means for so actuating the stop-arm 25, in  
20 one form, comprises a box-cam 37 having a suitably shaped cam race or groove 37' in a face thereof; said cam being fixed on and rotated by said drive shaft 16 of the machine. Fixed on said rock-shaft 24 is a  
25 lever member 38, the free end portion of which carries a roller stud 39 to engage in said cam race 37', whereby said lever member 38 is oscillated by each revolution of the cam 37, to in turn oscillate the rock-shaft 24. Inasmuch as the drive-shaft 16 makes one  
30 complete revolution to each stitch forming operation of the sewing mechanism driven thereby, it will be obvious that the rock-shaft 24 will be actuated to lower and raise the stop-arm 25 and its stop-fingers 27 and  
35 27' in desired timed relation to needle movements.

Assuming that it is desired to stitch over fastener tape T having attached thereto and spaced thereon metallic fasteners F, as, e. g.,  
40 the eye-loops of hook and eye fastening devices, or to stitch said tape to a garment, in the operation of the machine, said tape T, or said tape and garment, is suitably led to the sewing mechanism, to be engaged between the presser foot and feed dog of the  
45 latter whereby it is fed past said sewing mechanism. As the tape is advanced by these work-feeding devices, an eye loop F is carried toward the path of needle descent. Preparatory to stitch initiating  
50 downward stroke of the needle 20, the stop-arm 25, by the timing control of the actuating cam 37, is lowered to interpose the stop-fingers 27 and 27' in opposition to the advancing movement of the eye-loop F (see Fig. 1). The auxiliary stop-finger 27' is opposed to the advancing eye-loop F preparatory to the formation of a stitch immediately preceding the stitch to be carried  
55 across the leading side *f* of the eye-loop. During the feeding movement of the tape T, incident to the formation of said preceding stitch, the stop arm 25 is raised to withdraw the stop-finger 27' from opposition to the  
60 advance of the eye-loop, and then lowered

to interpose the main stop-finger 27 in opposition to the leading side *f* of the eye loop F, so as to arrest the eye-loop, preparatory to the next descent of the needle 20 when completing said preceding stitch and initiating  
70 the stitch which is to carry across the leading side *f* of the eye loop F. As the main stop-finger 27, when thus lowered, opposes and arrests the leading side *f* of the eye-loop, the auxiliary stop-finger 27', which is also lowered, will engage behind the leading side *f* of the eye-loop (see Fig. 2). It will thus be seen that, while the main stop-finger 27 holds the leading side *f* immediately adjacent to but out of the path of  
80 needle descent, the auxiliary stop-finger 27' will engage the opposite or rearward face of said leading side *f*, so that any tendency to backward displacement of the eye-loop, due to pulling or stretching strains exerted by operator, in guiding and manipulating the work being sewn, will be prevented, and consequently no risk is involved in so displacing the eye loop that, on the next feeding impulse of the work feed mechanism, the metal side of the eye-loop will stop in the path of needle descent when completing the cross-over stitch. Furthermore, preparatory to the advance of the work during the formation of the cross over stitch, the stop-arm 25 is raised to liberate the eye-loop for advance with the work (see Fig. 3), and is after such advance again lowered, whereby the main stop-finger 27 is disposed behind the advanced leading side *f* of the eye loop so that back-pulling or stretching of the work by the operator will not tend to displace the eye loop (see Fig. 4).

The above described operations are repeated as the trailing side *f'* of the eye loop approaches, is moved past and leaves the path of needle descent, and during the formation of a cross over stitch relative to said trailing side *f'*. Fig. 5 shows the stop-arm and its stop-fingers operatively engaging the trailing side *f'* of the eye-loop preparatory to the initiation of a stitch formation to cross over the same; the eye-loop being held by stop-finger 27 against forward displacement, and by the auxiliary stop-finger 27' against rearward displacement.

It is to be noted that the stop means is quick acting, comprising direct up and down movements of the stop-fingers without pushing or pulling effect upon the work, and consequently all tendency of the stop-means to ruffle, wrinkle or displace the goods from desired flat and smooth condition is eliminated; furthermore, the operation of the stop-means can be very accurately timed in relation to needle movements, so as to bring the stop-fingers into operative fastener arresting and holding position at any desired moment of the phase of needle movement. The stop-fingers are of small cross-sec-

tional area so that the same may easily and effectively enter the interior confines of the eye-loops, especially when being brought into operative relation to the trailing sides of said eye-loops.

The main distinction between the present invention and that of my aforesaid co-pending application resides in the provision of the auxiliary stop-finger in advance of the main stop-finger, whereby control of the eye-loops during the formation of stitches immediately preceding the cross of stitches is assured, as well as retention of the eye-loops against displacement due to back pulling or stretching strains applied to goods carrying the eye-loops by the operator when manipulating said goods during the sewing operations; and especially when the needle is entirely out of the cloth and the feed-dog is below the level of the throat plate, since at such time the only means holding the work and eye loops against displacement by back-pulling is the spring pressure of the presser foot. Such pressure of the presser foot is insufficient to prevent backward displacement of the eye even under the least back-pulling strain on the work.

Since changes could be made in the above described construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In combination, a sewing mechanism, including work-feeding means and a cooperating reciprocating needle; stop means disposed in the path of movement of eye fasteners on material fed to said sewing mechanism; said stop means having spaced stop-fingers which during the descent of the needle to initiate a stitch to cross a side of an eye fastener are disposed respectively one in front of and one behind the side to be thus crossed to prevent both forward and backward displacement of said side relative to the path of needle descent while the material operated upon is disengaged by the work-feeding means, and means to produce timed momentary lifted release of said stop fingers preparatory to stitch-forming advance of the material operated upon as effected by the work-feeding means.

2. In combination, a sewing mechanism, including work-feeding means and a cooperating reciprocating needle; a vertically movable stop-arm having a main stop-finger and an auxiliary stop finger spaced in advance of said main stop-finger, and means to produce timed movements of said stop-arm to momentarily raise said fingers from work arresting position preparatory to stitch form-

ing advance of the material operated upon as effected by the work-feeding means.

3. In combination, a sewing mechanism, including work feeding means and a cooperating reciprocating needle; a vertically movable stop arm having a main stop-finger disposed adjacent to the approach side of the line of needle descent and in the path of movement of fasteners as carried toward said sewing mechanism by the work-feeding means, and an auxiliary stop finger forwardly spaced from said main stop finger to engage the rear of a fastener side stopped against said main stop finger.

4. In combination, a sewing mechanism, including work feeding means and a cooperating reciprocating needle; a vertically movable stop arm having a main stop-finger disposed adjacent to the approach side of the line of needle descent and in the path of movement of fasteners on material carried toward said sewing mechanism by said work-feeding means, and an auxiliary stop finger forwardly spaced from said main-stop finger to engage the rear of a fastener side stopped against said main stop finger; and means to raise and lower said stop-arm to temporarily remove said stop-fingers from arresting relation to the fastener sides after the needle has entered the material to be sewn and preparatory to the operative feeding engagement of the material by the work-feeding means.

5. In a sewing machine for stitching over material having eye fasteners thereon, means for advancing the material to the stitching mechanism of the machine, a vertically movable stop-arm, said stop-arm having a main stop finger provided with an eye fastener arresting face in a plane in advance of the path of needle descent so as to stop movement of one or the other side of said eye fastener into the path of needle descent preparatory to the formation of a stitch to cross over such eye fastener side, and said stop arm also having an auxiliary stop-finger disposed to engage behind the eye fastener side to be stitched over to retain the same against backward displacement relative to the path of needle descent.

6. In a sewing machine for stitching over material having eye fasteners thereon, means for advancing the material to the stitching mechanism of the machine, a vertically movable stop-arm, said stop-arm having a main stop finger provided with an eye fastener arresting face in a plane in advance of the path of needle descent so as to stop movement of one or the other side of said eye fastener into the path of needle descent preparatory to the formation of a stitch to cross over such eye fastener side, said stop arm also having an auxiliary stop-finger disposed to engage behind the eye fastener side to be stitched over to retain the same against

backward displacement relative to the path  
of needle descent, and means to produce  
timed movements of said stop-arm to tempo-  
rarily remove said stop-fingers from arrest-  
5 ing relation to the fastener sides after the  
needle has entered the material to be sewn  
and preparatory to operative movement of  
the work-feeding means and accompanying  
stitch-forming operations of the stitching  
10 mechanism.

In testimony, that I claim the invention  
set forth above I have hereunto set my hand  
this 2nd day of July, 1931.

LEO ROSEMAN.

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