

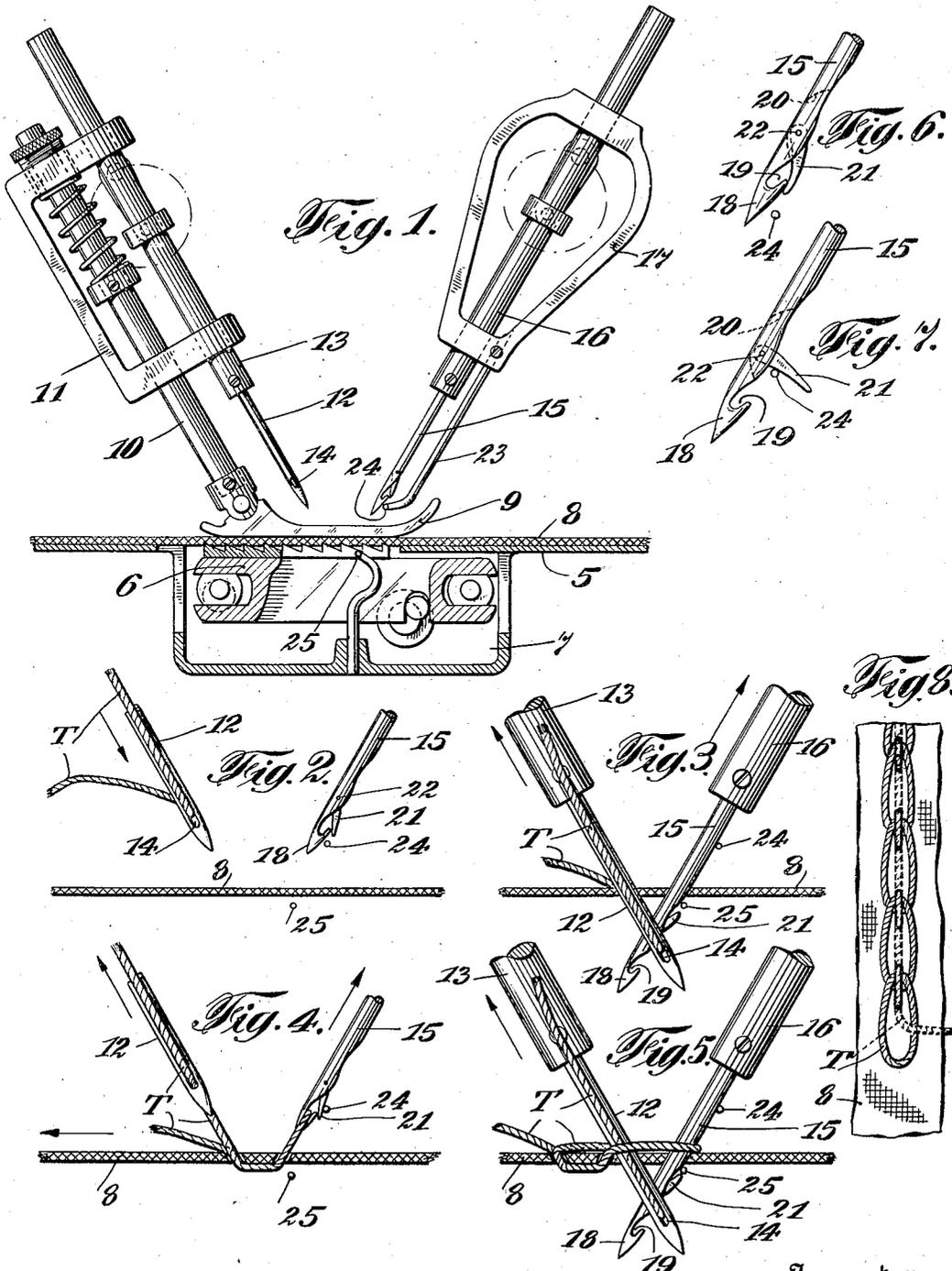
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STITCH FORMING MECHANISM FOR SEWING MACHINES

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STITCH-FORMING MECHANISM FOR SEWING MACHINES.

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This invention relates to an improved stitch forming mechanism for sewing machines and has for its primary object to provide an improved cooperative arrangement of thread carrying and loop forming needles with means cooperating with the latter whereby a chain stitch will be accurately formed.

It is another object of the invention to provide a sewing machine needle for forming the thread loops having an open hook or eye with a normally closed latch element adapted to pass through the material in the reciprocation of the needle. In conjunction with this needle, suitable means are arranged above and below the line of feed of the material for moving the latch element to open and closed positions respectively.

It is a further general object of my invention to provide a stitch forming mechanism for sewing machines which is relatively simple in its construction, positive and reliable in practical operation and may be readily applied to various types of sewing machines now in general use.

With the above and other objects in view, the invention consists in the improved stitch forming mechanism and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claim.

In the accompanying drawings, wherein I have illustrated one practical and satisfactory embodiment of the invention and in which similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a sectional view through the bed plate of a sewing machine illustrating a conventional type of material feeding mechanism and showing my new stitch forming mechanism in cooperative relation therewith:

Figs. 2, 3, 4 and 5 are detail views illustrating the different positions of the two reciprocating needles in the successive stitches of forming the chain stitches;

Figs. 6 and 7 are detail fragmentary elevations of the loop forming needle showing the pivoted latch elements in closed and open positions respectively, and

Fig. 8 is a fragmentary view of a portion of material illustrating the chain stitches

as formed by means of my present invention.

For purposes of illustration, I have shown a section of the bed plate 5 of a sewing machine having the usual throat plate beneath which there is arranged any approved type of material feeding mechanism generally indicated at 6 and which is preferably enclosed or housed within a suitable casing 7 depending from the under side of the bed plate. The mechanism 6 feeds the material indicated at 8 in a step by step movement longitudinally over the surface of the bed plate beneath the presser foot indicated at 9. As herein shown, this presser foot at one of its ends has a pivotal connection with a rod 10 yieldably supported for reciprocating movement in a suitable bracket 11.

The improved stitch forming mechanism constituting the subject matter of the present application includes a thread carrying needle 12 suitably secured in the lower end of a needle bar 13 mounted to reciprocate in the bracket 11 and actuated by any conventional type of mechanism now commonly employed for this purpose. The needle 12 is of the usual type having an eye 14 at its pointed end through which the thread indicated at T is drawn.

The loop forming needle 15 is arranged in cooperative relation with the thread carrying needle 12 and is suitably fixed in the lower end of a second reciprocatory needle bar 16 connected with a suitable actuating mechanism, said needle bar reciprocating in the frame or bracket member 17. As shown in the drawings, I preferably arrange the needle bars 13 and 16 for movement in oblique angular directions converging towards the presser foot 9 so that the needles after passing through the material 8 will cross each other in intersecting paths as illustrated in Fig. 3 of the drawings. As shown, the needles are arranged in a vertical plane parallel with the line of movement of the material 8, but it will be understood that this is not an essential requisite and that the needles might be otherwise arranged if desired.

The loop forming needle has a tapered or pointed end 18 to penetrate the material and at the inner end of the point and at one side thereof a notch or hook 19 is formed. The shank of the needle adjacent this hook is slotted or recessed as at 20 and in said slot one end of a latch element 21 is pivot-

ally mounted as at 22. This latch element normally occupies a closed position over the open side of the hook 19 with its free end in engagement with the bill of the hook as shown in Fig. 6 of the drawings.

To the lower end of the frame or bracket member 17 one end of a longitudinally projecting rod 23 is suitably fixed, said rod at its other end terminating in an angular offset portion extending toward the needle 15 having a stud or pin 24 projecting transversely of the needle. A similar pin or stud 25 is suitably mounted and fixed in position beneath the bed plate 5.

In the operation of the mechanism above described, the needles are simultaneously reciprocated in the same directions so that they penetrate the material 8 approximately at the same time during the period of rest of the material. When at the limit of their upward movement, it will be observed that the latch element or tongue 21 of the loop forming needle is positioned above the pin 24. Therefore, in the downward movement of said needle the pin engages the free end of said latch element and moves the same to its open position as shown in Fig. 7 of the drawings, said pin holding the tongue in open position until the point of the needle has penetrated the material 8, said element being thereafter held in open position until it passes below the material 8 and below the pin 25. The thread carrying needle 12 in its downward movement from the position shown in Fig. 2 to the position shown in Fig. 3 carries the thread through and below the material. The end of the needle 15 at the same time passes between the thread and one side of the needle 12 in intersecting relation with the latter until the hook 19 is below the thread, passing through the eye of the needle 12. The needles are then moved upwardly so that the hook 19 of the needle 15 catches the thread below the material and forms a loop therein, and as the needle 15 moves upwardly, pin 25 engages the latch element 24 and moves the same to its closed position to retain the thread loop in the hook of the needle. The loop is thus drawn upwardly until the latch element 21 is again positioned above the pin 24. As the material 8 is now fed in the direction indicated by the arrow in Fig. 4 of the drawings, the thread loop is laid down upon the surface of the material as the needles 12 and 15 again start their downward movement and the needle 12 passes through the loop thus formed, it being understood that the latch element 21 is moved to open position by the pin 24 to release the loop from the hook 19. The hook then again engages the thread carried in needle 12 to

form a second loop therein and pull the same upwardly through the material and through the end of the first loop. The described operations continue to form the chain stitching as illustrated in Fig. 8 of the drawings.

From the foregoing description considered in connection with the accompanying drawings, it is believed that the manner of operation of my improved stitch forming mechanism will be clearly understood. It will be seen that by the provision of the special loop forming needle as shown in detail in Figs. 6 and 7 of the drawings, the two reciprocating needles will cooperate in a positive and reliable manner to accurately form the chain stitches. It will be apparent that this new needle mechanism constituting the essential part of the stitch forming means of the sewing machine can be readily applied to various different types of sewing machines now in general use without necessitating any material alterations in the construction thereof. Also as above noted, the mounting and arrangement of these needles as illustrated in the accompanying drawing is merely suggestive and other possible arrangements thereof may be adopted in the application of the invention to a particular type of sewing machine. Therefore, while I have herein shown and described one simple and satisfactory embodiment of my present improvements, it is nevertheless to be understood that various modifications in the form, proportion and relative arrangement of the several parts may be resorted to without departing from the spirit and scope of the invention as claimed.

I claim:

In a stitch forming mechanism for sewing machines, the combination of a loop-forming needle having a hook at its end, an eyeletted thread-carrying needle, the two needles being mounted to reciprocate obliquely with respect to each other and to cross each other after passing through the material to be stitched, the loop-forming needle having a pivoted latch adjacent the hook to close the hook and open same, and a pair of studs, one on one side of said material and the other on the opposite side, in position for the stud on the side of said material where the needles cross to engage said latch so that it closes the hook at the beginning of the return stroke of the loop-forming needle, and for the remaining stud to actuate the latch so that the hook is opened upon the beginning of the next forward stroke of said needles.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

VICTOR J. SIGODA.