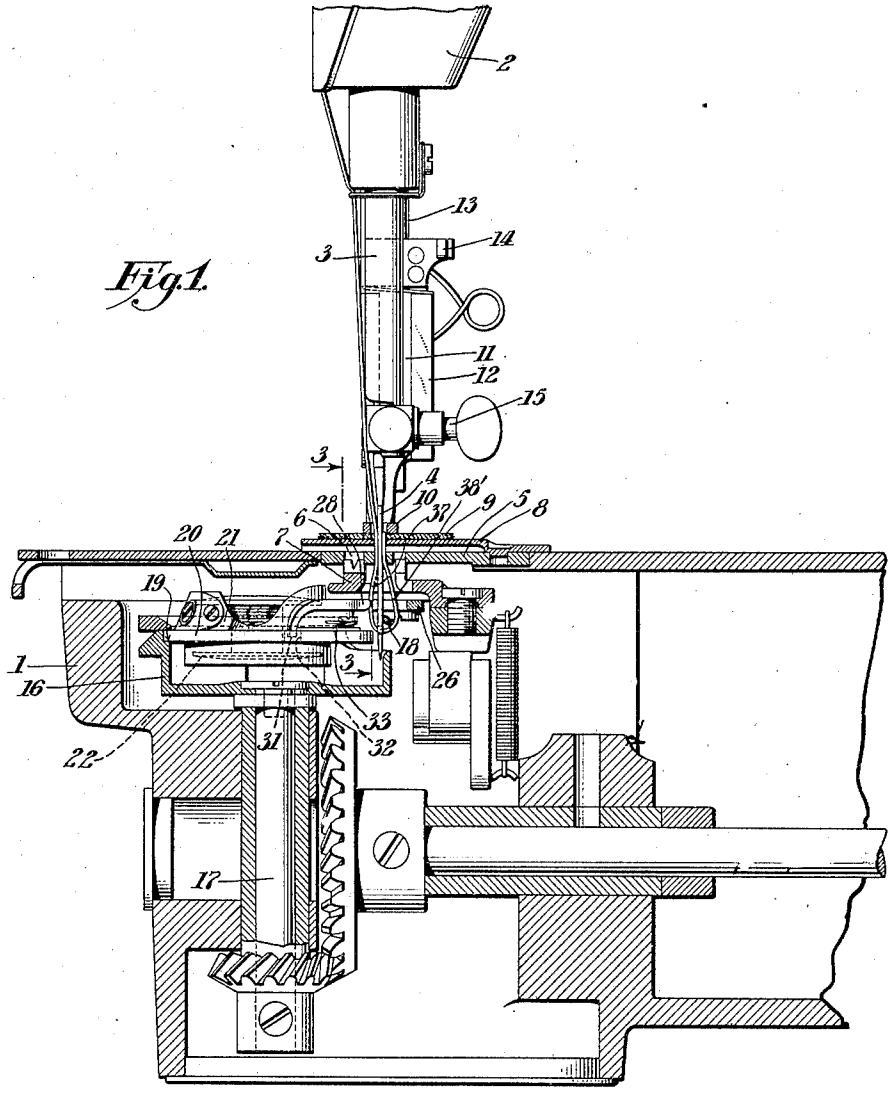
Nov. 11, 1930. W. L. BARRON 1,781,427

STITCH FORMING MECHANISM FOR SEWING MACHINES

Filed Oct. 26, 1928 2 Sheets-Sheet 1

Fig. 1.



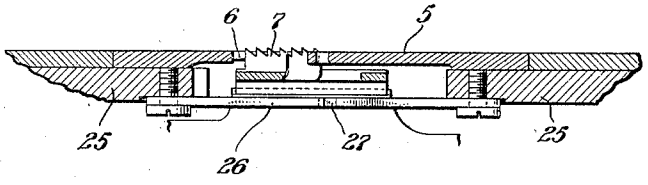


Fig. 3.

Inventor
William L. Barron

Witnesses:
Godfrey Peirce
Dorothy E. Wright

By John F. Heins
Attorney

Nov. 11, 1930. W. L. BARRON 1,781,427

STITCH FORMING MECHANISM FOR SEWING MACHINES

Filed Oct. 26, 1928 2 Sheets-Sheet 2

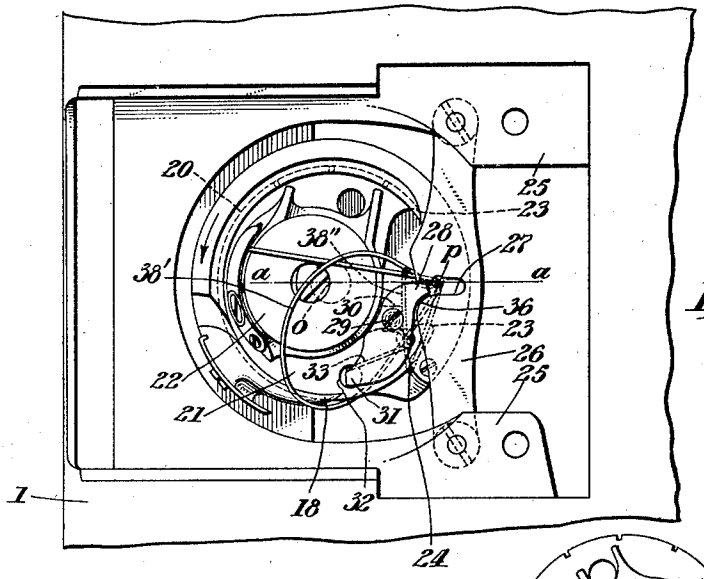


Fig.2.

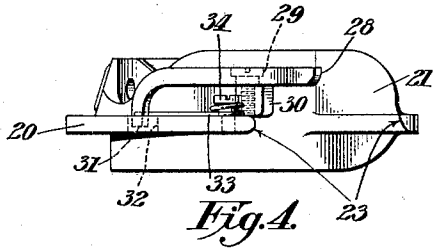


Fig.4.

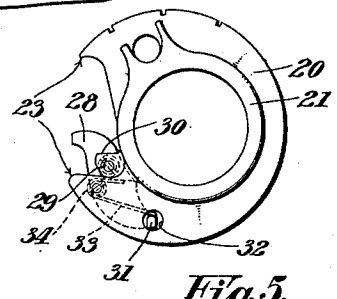


Fig.5.

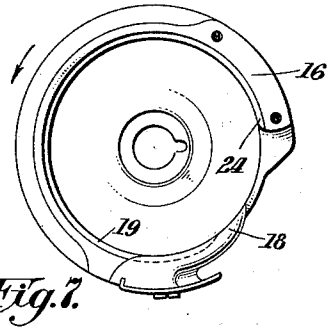


Fig.7.

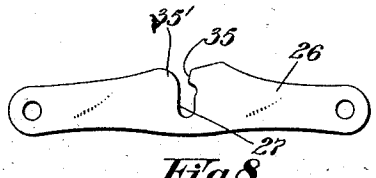


Fig.8.

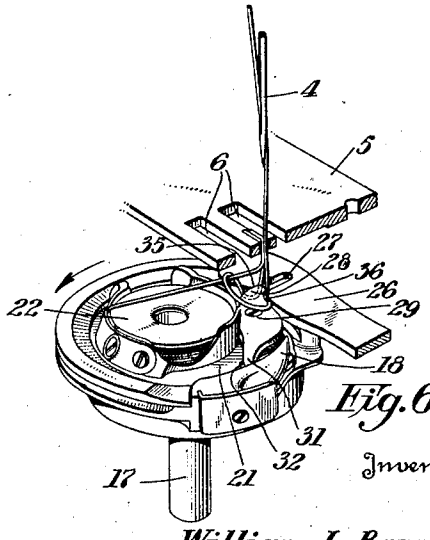


Fig.6.

Inventor

William L. Barron

By John F. Hering

Attorney

Witnesses:
Godfrey Peeing
Dorothy E. Wright

Patented Nov. 11, 1930 1,781,427

UNITED STATES PATENT OFFICE

WILLIAM L. BARRON, OF LAURENCE HARBOR, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY

STITCH-FORMING MECHANISM FOR SEWING MACHINES

Application filed October 26, 1928. Serial No. 315,114.

This invention relates to sewing machines, more particularly of the rotary hook type disclosed, for example, in the patent to Martin Hemleb, No. 1,149,049 of Aug. 3, 1915, and has for an object to provide a machine of this type with means for assisting the needle in throwing out its loop, while maintaining the freest possible provision for maximum contraction of the needle-loop with the hook in cast-off position; such provision being particularly desirable in embroidering operations where the work is shifted by hand to place the stitches in accordance with the pattern to be stitched.

In doing embroidery work on a sewing machine, the hand-shifting of the work has a take-up action on the needle-loop cast around the lower thread-mass, and the maximum length of embroidery stitch which can conveniently be made depends upon the amount by which the needle-loop can be freely contracted after the hook reaches cast-off position, and before the opening of the usual gap in the bearing between the thread-case and hook for final escape of the needle-loop.

In the machine of said Hemleb patent there is a thread-case rotation-restraining bar formed in one edge with two notches. One of these notches is for clearance of the needle and the nascent needle-loop. The other notch, which is disposed at one side of the needle-clearance notch, is entered by a lug on the thread-case to restrain the latter from rotation with the hook. It has been found desirable to add to the thread-case of the machine of said Hemleb patent a second lug, disposed alongside the rotation-restraining lug and opposite the mouth of the needle-clearance notch, to function as a stop for preventing expansion of the nascent needle-loop on the wrong side of the needle and to force the needle-loop to expand primarily on the side of the needle passed by the loop-seizing beak of the hook. The requirement for the needle-loop stop further hampers the machine for embroidery work, as it limits the size to which the cast needle-loop can be contracted prior to its final escape from the thread-case.

According to the present improvement, the customary needle-loop stop is omitted but its desirable function is retained by constructing the thread-case rotation-restraining bar with a single notch having both needle-loop clearance and thread-case rotation-restraining functions. The mouth of the notch is entered and substantially closed by a finger on the thread-case and the closed mouth constitutes a stop or abutment for preventing expansion of the nascent needle-loop on the wrong side of the needle. The omission of the needle-loop stop-lug and the consolidation into one notch of the two previously used notches in the thread-case rotation-restraining bar, simplifies the construction without sacrifice of advantages of the prior construction and with a gain in the amount by which the cast needle-loop may be taken up, prior to its final escape from the thread-case, thus improving the operating characteristics of the stitch-forming mechanism, more particularly for embroidering operations.

In the accompanying drawings, Fig. 1 is a side elevation, partly in section, of a rotary hook stitch-forming mechanism embodying the invention. Fig. 2 is a plan view of the rotary hook and thread-case elements of the mechanism. Fig. 3 is a section on the line, 3—3, Fig. 1. Fig. 4 is a side elevation of the thread-case. Fig. 5 is a bottom plan view of the thread-case. Fig. 6 is a perspective view of the stitch-forming mechanism showing the needle-loop escaping from the thread-case. Fig. 7 is a plan view of the rotary-hook, and Fig. 8 is a plan view of the rotation-restraining bar.

In the preferred embodiment of the invention illustrated, 1 represents the bed of a sewing machine and 2 the head of the usual gooseneck in which is mounted the reciprocating needle-bar 3 carrying the eye-pointed needle 4. The bed 1 carries the usual throat-plate 5 having slots 6 in which the four-motion feed-dog 7 operates. As the present machine is fitted for embroidering, the feed-dog 7 is covered and rendered ineffective by the feed-cover plate 8 upon which the fabric 9 is pressed intermittently by a suitable embroidery presser 10; the one shown having a downwardly spring-pressed shank 11 slid-

ably mounted in a vertical guide 12 carried by the presser-bar 13. The shank 11 has fixed to its upper end an arm 14 which overhangs the needle-clamp-screw 15 and is engaged by the latter, as the needle-bar 3 near the end of its upstroke, thereby lifting the foot 10 to free the work for hand-manipulation of the latter.

Cooperating with the needle 4 is the rotary under-thread mechanism including the cup-shaped rotary-hook-body 16 carried by the vertical shaft 17 and formed with a loop-seizing beak 18 and a bearing support 19 for the flange 20 of the thread-case 21 having the usual pocket for the bobbin 22. The bearing flange 20 of the thread-case is not continuous but is formed adjacent the path of the needle 4 with a gap 23 for escape of the needle-loop, when said gap is opened by passage of the trailing end 24 of the bearing 19 of the hook-body into such gap.

Screwed to the under sides of the bed-lugs 25 are the ends of the thread-case rotation-restraining bar 26 formed in one edge with a needle-clearance notch 27 the mouth of which is entered by the curved end 28 of a finger pivoted at 29 on a lug 30 on the thread-case 21. The finger is formed with a down-turned tail 31 which freely enters a somewhat larger hole 32 in the thread-case. A spring 33 coiled about the screw 34 on the thread-case and bearing at one end against the lug 30 engages the tail 31 of the finger and yieldingly presses it outwardly against the side of the hole 32. The finger 28 is curved convexly toward a line *a*—*a* joining the axis *o* of the hook with the needle-path *p*. This direction of curvature facilitates the contraction of the needle-loop and the ready escape of the latter through the curved gap 36 to be referred to.

In the operation of the machine, the frictional drag of the hook-body upon the thread-case maintains the finger-end 28 in engagement with the side 35 of the mouth of the notch 27 in the rotation-restraining bar 26, leaving a narrow curved gap 36, Fig. 2, between the curved finger end 28 and the other side 35′ of the mouth of the notch 27. The side 35 of the mouth of the notch 27 is closed adjacent the needle-path and is engaged by one limb 37 of the needle-loop 38, Fig. 1, forcing the needle-loop 38 to expand into the notch 27 where it is in position to be seized by the loop-taker beak 18.

When the hook reaches cast-off position, the expanded needle-loop 38′ is free to be contracted, as by a manual shift of the work, to dotted line position 38″; the trailing end 24 of the thread-case bearing of the hook-body not, as yet, having opened the gap 23 in the bearing flange 20 of the thread-case for final escape of the needle-loop.

When the needle-loop escapes through the gap 23, it is drawn up through the curved gap 36 between the rotation-restraining finger 28 and the bar 26, as shown in Fig. 6, after which the needle-loop is pulled up between the finger 28 and the side 35 of the mouth of the notch 27; the finger 28 yielding about its pivot 29 to open a gap for the needle-loop, without necessitating a shift of the entire thread-case.

The invention is not to be understood as limited to the exact form and arrangement of parts shown and described as these may obviously be variously modified within the scope of the invention, by one skilled in the art.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, a reciprocating needle, a rotary hook having a loop-taking beak, a bobbin-case, a bobbin-case rotation-restraining element having a notch embracing the needle-path, said notch having an open mouth at one side of the needle-path and a closed-bottomed throat at the opposite side of the needle-path, at which opposite side the beak of the hook is arranged to pass in taking a needle-loop, and means on the bobbin-case entering the mouth of said notch to restrain the bobbin-case from rotation.

2. In a sewing machine, a reciprocating needle, a throat-plate, a rotary hook having a loop-taking beak, a bobbin-case, a bobbin-case rotation-restraining bar spaced below the under surface of the throat-plate and close to the path of the loop-taking beak, a feed-dog overhanging said rotation-restraining bar, said bar having a notch in one edge embracing the needle-path, said notch having an open-mouth at one side of the needle-path and a closed-bottomed throat at the opposite side of the needle-path, at which opposite side the hook-beak is arranged to pass in taking a needle-loop, and means on the bobbin-case entering the mouth of said notch to restrain the bobbin-case from rotation.

3. In a sewing machine, a reciprocating needle, a rotary hook, a bobbin-case, a bobbin-case rotation-restraining bar having in one edge a needle-clearance notch deepened to form a closed-bottomed needle-loop clearance throat at the same side of the needle-path passed by the hook-beak, and means on the bobbin-case entering the mouth of said notch in position to engage one limb of the nascent needle-loop and function as a stop forcing the other limb of the needle-loop to bow into the closed-bottomed throat of the notch in said rotation-restraining bar.

In testimony whereof, I have signed my name to this specification.

WILLIAM L. BARRON.