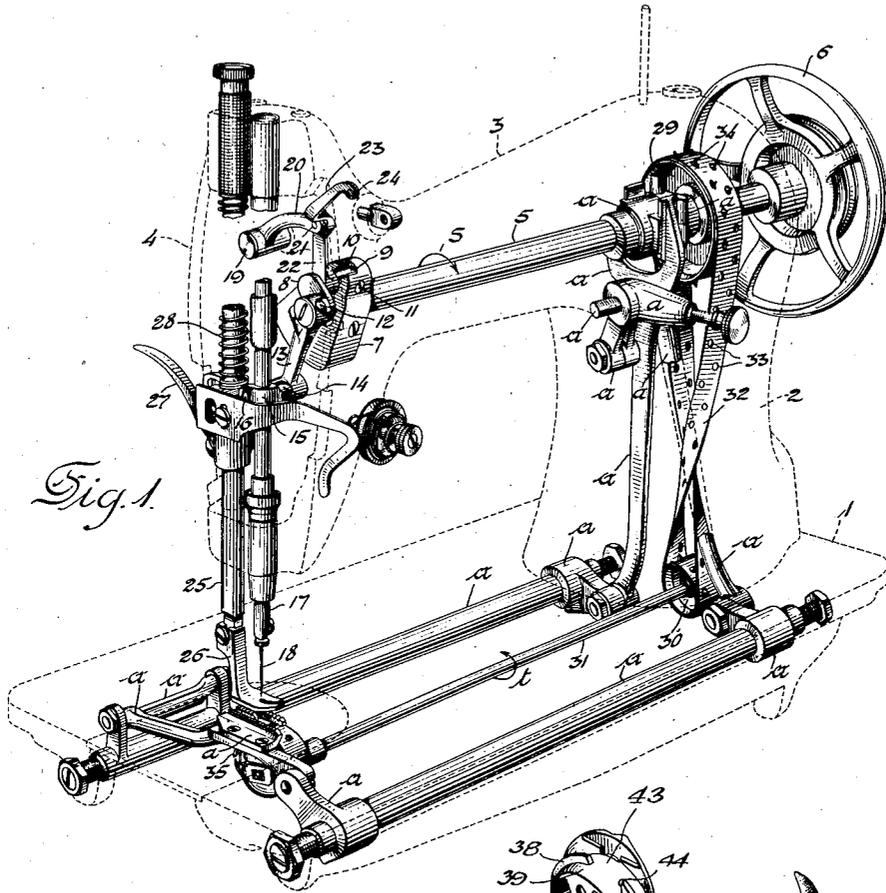


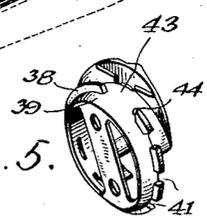
H. J. COX.  
 SEWING MACHINE.  
 APPLICATION FILED MAY 9, 1911.

1,062,696.

Patented May 27, 1913.



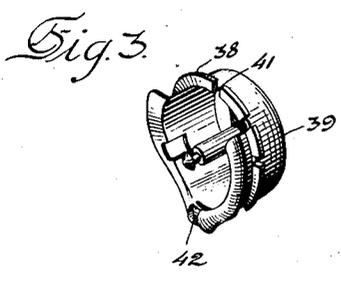
*Fig. 1.*



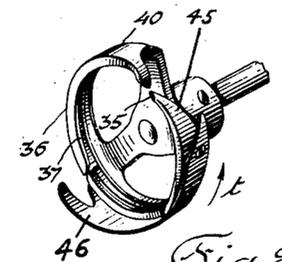
*Fig. 5.*



*Fig. 4.*



*Fig. 3.*



*Fig. 2.*

WITNESSES:

*Geza Verma*  
*W. P. Stewart*

INVENTOR

*Henry J. Cox*

BY

*F. H. Johnson*

ATTORNEY

# UNITED STATES PATENT OFFICE.

HENRY J. COX, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

SEWING-MACHINE.

1,062,696.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed May 9, 1911. Serial No. 625,960.

*To all whom it may concern:*

Be it known that I, HENRY J. COX, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in sewing machines, and has for its object to improve the stitch-forming mechanism; and to this end the commonly-employed main or needle-bar-actuating shaft and needle-thread take-up, the latter having its thread-receiving end located at the front of the sewing machine bracket-arm and having movements in a vertical plane transverse to the axis of said shaft, are combined with a loop-taker having a plurality of rotations to the right to one rotation of said main-shaft to the left.

It is universally recognized by those versed in the art that a lock-stitch rotary loop-taker actuated from a variable motion driver, such as was commonly employed prior to the commercial introduction of loop-takers having a plurality of rotations to one complete actuation of the needle-carrying bar, fails to meet the requirements of "high speed" as it is generally understood at the present time, and that when in high speed sewing machines of the character herein referred to the loop-taker shaft and the main-shaft are given rotations in the same direction, one of said shafts fails to effect its full measure of utility. It is also extremely essential that the upper or main-shaft be rotated toward the left or toward the operator, for if rotated in the opposite direction it would be necessary, in order to maintain the proper timing of the movements of the take-up, to change the operative relationship of the latter with respect to said main-shaft, as is shown and described in United States Patent No. 663,808, issued to P. Diehl, December 11, 1900 (see Figure 2 of said patent in connection with the present Fig. 1), which form of construction is objectionable as it places the means for guiding and controlling the needle thread at the rear instead of at the front side of the bracket-arm, as in the present construction; and it is believed that this is true of all take-ups operated from the main-shaft through a link connection. The rotation of the main-shaft

to the left also adds to the convenience of manually manipulating said shaft by presenting to the operator the more commonly employed direction of rotation, making it more natural to manually turn said shaft in its stitch-forming direction when, for any purpose, it is desired to adjust the vertical position of the needle with respect to its limit of movement, thus avoiding to a substantial degree the breaking of the sewing threads and the carrying of such threads into the inner or bobbin case bearing of the loop-taker, as is likely to occur when said shaft is rotated in the opposite direction.

Referring now to that class of loop-takers employing a cast-off portion and an internal bearing into which the bobbin-case is journaled, as in the present instance, the preferred direction of rotation is to the right or away from the operator, which permits of positioning the loop-seizing point at the outer edge of the loop-taker, thus causing the latter to cast the loop of needle thread about the under thread in a direction from the rear to the front of the machine and positioning the needle in substantially vertical alinement with the bobbin-case stop elements and the outer face of the bobbin, whereby the loop of needle thread is caused to pass between said stop elements in substantially vertical alinement with the needle-eye and the outer face of the bobbin, which substantially eliminates all danger of the thread becoming broken or damaged by passing between said elements. To the advantages derived from employing a loop-taker having rotations as in the present construction may be added the convenience of threading the needle from left to right, thus entering the thread in the needle-eye at the side most exposed to the light.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Fig. 1 is a view in perspective of the actuating mechanism of the sewing machine, the bed-plate and bracket-arm being shown in dotted lines to more clearly illustrate the features in construction important to the invention, Fig. 2 a perspective view of the loop-taker, Fig. 3 a perspective view of the bobbin-case reversed, with respect to its vertical diameter, from the position shown in Fig. 1, Fig. 4 a detail of the loop-taker guide-flange and Fig. 5 a perspective of the

back or bottom portion of the bobbin-case shown in Fig. 3.

The bed-plate 1 and the bracket-arm, the latter comprising the standard 2, overhanging arm 3 and head 4, are shown in dotted lines only.

5 5 represents the main or needle-bar driving shaft mounted to rotate to the left, or in the direction indicated by the arrow *s* in  
10 suitable bearings (not shown) formed in said bracket-arm. Said shaft carries at its rear end the hand or band-wheel 6 and at its opposite end the flange 7, carrying the crank  
15 8, the hub or bearing 9 of which enters a suitable opening 10 formed in said flange and is secured to rotate with the latter by the screw 11. The hub or bearing 12 of said  
20 crank receives the upper end of the needle-bar actuating link 13, the opposite end of which is fulcrumed on the stud 14 of the collar 15 secured by pinch screw 16 on the  
25 needle-bar 17 provided with an eye-pointed needle 18, to which stitch-forming movements are thus transmitted.

25 Suitably secured in the head 4 is a stud 19 and upon said stud is fulcrumed one end of a link 20, the opposite end of which is pivotally attached, by pin 21, to the needle  
30 thread take-up comprising the actuating lever 22 and take-up arm 23 provided at its free end with a thread-eye 24, said actuating lever being fulcrumed upon the bearing  
35 9 of the crank 8, and thus movements are transmitted from the main-shaft 5 to said take-up in a vertical plane transverse to the axis of said shaft. 25 is the presser-  
40 bar provided at its lower end with a cloth-presser 26, a manually operated presser-lifting lever 27 acting to raise said presser-foot and cloth-presser in opposition to the  
45 resiliency of the spring 28 in a manner common to sewing machines generally.

As the elements comprising the feeding mechanism are of ordinary construction and  
45 may be as herein illustrated or of any other approved form, it has been deemed sufficient to designate the most important of said elements by the letter *a*.

29 represents the belt connection driving  
50 pulley carried by the main-shaft 5 and 30 the belt connection driven pulley fast upon the looper-actuating shaft 31, the latter being mounted to rotate to the right or in the  
55 direction indicated by the arrow *t* in suitable bearings (not shown) formed at the underside of the bed-plate 1, and 32 is the belt connection. The pulleys 29 and 30 and  
60 belt connection 32 are of usual construction, but owing to the eyelets or openings, as 33 in the belt connection and their coacting elements consisting of conical pins, as 34, carried by the respective pulleys, the crossing  
65 of the belt connection 32 substantially increases the effectiveness of said connection, resulting in a more perfect synchronization

of the movements of the loop-seizing point 35 of the loop-taker 36 with respect to the stitch-forming movements of the needle 18.

It will be obvious to those versed in the art, that it is practically impossible to effect a given timing of the rotating shafts  
70 5 and 31 by the employment of a belt connection, unless means are provided for correcting the movements of the driven elements, such means herein comprising the  
75 openings 33 and coacting elements 34, and in this connection it will be evident that the crossing of the belt constantly holds a greater number of said openings and coacting elements in operative relationship than a  
80 straight belt such as has heretofore been used, thus increasing the efficiency of the belt without weakening its construction and, in addition to effecting the rotation of said shafts in the desired direction, lessening the  
85 liability of said openings to become elongated by the action of said coacting pins.

The loop-taker 36 is provided with the groove 37 for the reception of the flange 38  
90 of the bobbin case 39, as in earlier devices, and the removable gib 40 acts to hold said case in operative relationship with said loop-taker, said flange being provided with the usual notches, as 41, for breaking and removing any loose ends of thread which may  
95 be accidentally drawn into said groove through the action of said loop-taker. The bobbin case 39 is provided with a notch 42 which coacts with a suitable stationary stop (not shown) to hold said case against rota-  
100 tion.

The flange 38 of the bobbin-case 39 is provided with a notch or opening 43 located with respect to the notch 42, for holding the  
105 bobbin-case against axial movement, so that when the point 35 of the loop-taker engages the needle thread loop the idle or back half of the latter will be carried against the wall  
110 44 of the notch 43, the throat 45 of the loop-taker being shaped to carry the back half of the loop in toward the center of rotation of the loop-taker, while the outer half of the loop in the further rotation of the loop-taker is passed across the front of the bobbin-case  
115 by the cast off flange 46, the loop passing out of said notch when the opening in the groove 37 of the loop-taker uncovers said notch, as in earlier constructions, when the take-up acts to draw the loop up into the  
120 material.

In the operation of stitch-forming mechanisms of the present character, the loop-taker does not enter and pass through the loop of needle thread, as does a shuttle, but  
125 takes said loop and casts it about the bobbin-case journaled in the face of the loop-taker.

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

In a sewing machine, the combination of a stitch-forming mechanism comprising a  
130

main-shaft having rotary movements in a direction toward the operator, a loop-taker having rotary movements in a direction away from the operator, a bobbin-case provided with a notched flange journaled in the loop-taker and held against rotation, a needle-thread take-up lever pivotally connected to a stationary part of the sewing machine and operatively connected with the main-shaft with its thread end in the direction of the operator and having movements in a vertical plane transverse to the axis of said

main-shaft, and connections for connecting the main-shaft with the loop-taker to effect a multiple of rotations of the latter to one rotation of said main-shaft. 15

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HENRY J. COX.

Witnesses:

H. A. KORNEMANN, Jr.,

W. P. STEWART.

---