M. HEMLEB.

SEWING MACHINE LOOP TAKER.

APPLICATION FILED MAY 15, 1914.

1,149,049

Patented Aug. 3, 1915.

2 SHEETS—SHEET 1.

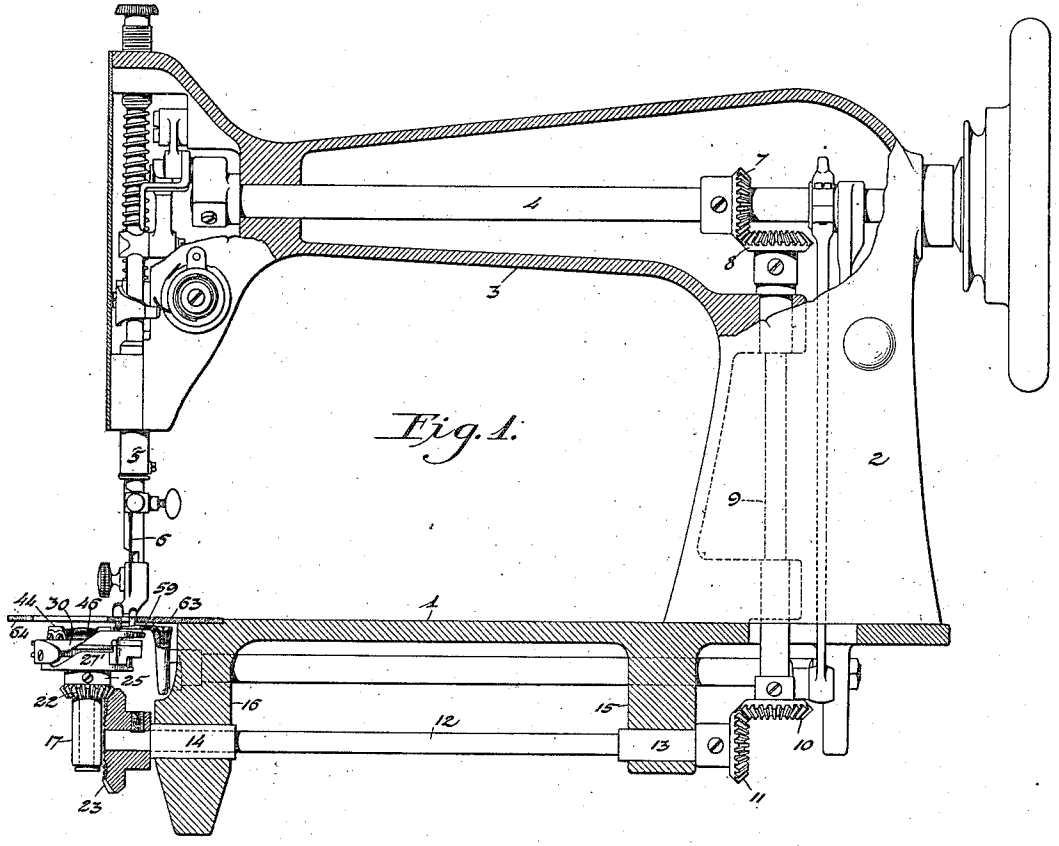

Fig. 1.

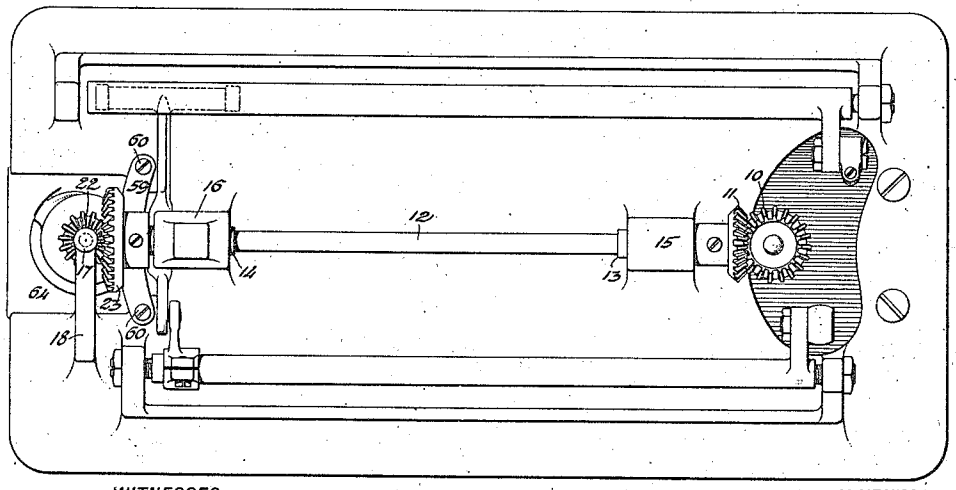

Fig. 2.

WITNESSES:

Geo. L. Fenwick

L. E. Fischer.

INVENTOR

Martin Hemleb

BY

Henry J. Mullen

ATTORNEY

M. HEMLEB.

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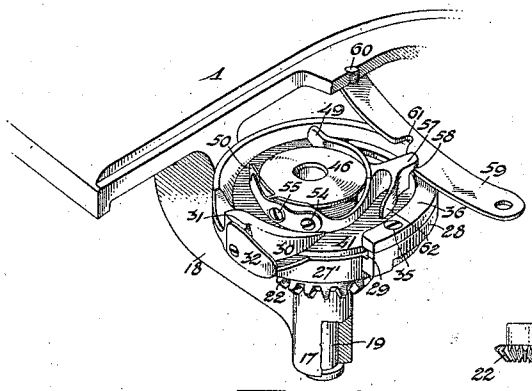


Fig. 3.

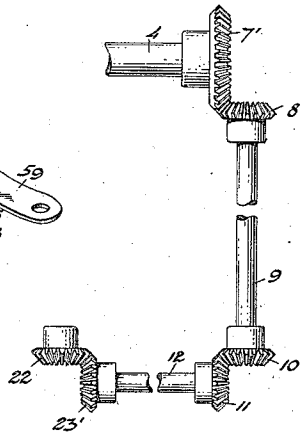


Fig. 10.

Fig. 5.

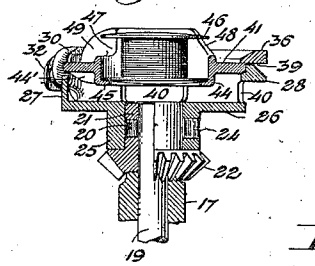


Fig. 6.

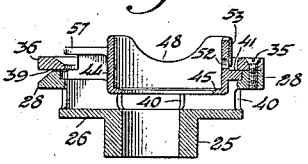


Fig. 4.

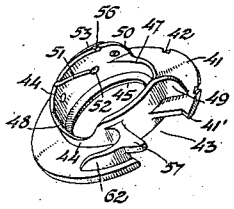
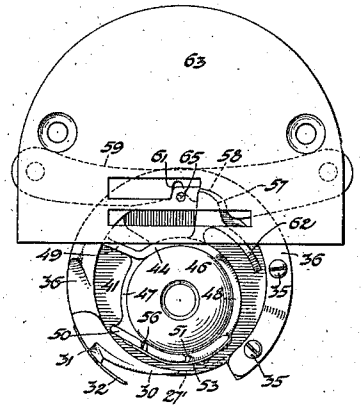


Fig. 7.



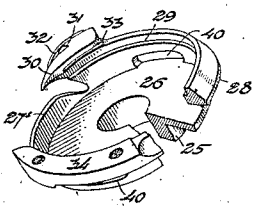


Fig. 8.

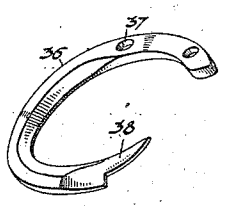


Fig. 9.

WITNESSES:

Geo. L. Terna.

L. E. Fischer.

INVENTOR

Martin Hemleb

BY

Henry J. Miller

ATTORNEY

# UNITED STATES PATENT OFFICE.

MARTIN HEMLEB, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

## SEWING-MACHINE LOOP-TAKER.

1,149,049. Specification of Letters Patent. Patented Aug. 3, 1915.

Application filed May 15, 1914. Serial No. 838,672.

*To all whom it may concern:*

Be it known that I, MARTIN HEMLEB, 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-Machine Loop-Takers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more particularly to an improvement in revolving hook machines in which the loop-taker performs circular movements upon an axis which is substantially vertical or parallel with the path of reciprocation of the needle; and it has for some of its chief objects to provide an advantageous construction of the loop-taking member for prevention of injury by penetration of lint or dirt in the bearings between the moving parts, to facilitate the removal and insertion of bobbins from the thread-case and to insure the free casting of the needle-thread loops over the thread-case.

In the preferred embodiment of the improvement, the loop-seizing member or hook is cup-shaped, with a closed bottom and apertured side-walls for the lateral release of lint or dirt deposited therein in the operation of the machine, thereby protecting from clogging a pair of intermeshing gears beneath the same from which it derives its operative movements. The hook is provided with an inwardly extending beak for seizure of a thread-loop from the needle reciprocating within its circular path of movement, and is formed with a segmental needle-guard beneath said beak to insure against collision of the point of the beak with the needle. The side wall of the hook is further provided in its inner face with an open-topped raceway in which the thread-case is peripherally fitted and confined therein by means of a yielding cover-plate between which and the top of the hook a lateral opening is provided adjacent the beak for ejection of foreign matter from the bearing with the thread-case thus provided.

The thread-case body is preferably of disk form and is constructed with an open-topped bobbin-cavity having a side wall projecting above said body and oppositely recessed or notched in the upper edge to expose the upper flange of a contained bobbin, the bobbin-cavity being arranged eccentrically to and at the side of the hook farthest from the needle-path so as to expose the full area of the bobbin-cavity laterally of the adjacent edge of the throat-plate for easy removal and insertion of the bobbin. The notches in the upper edges of the bobbin-case walls are arranged upon a diameter transverse to that intersecting the needle-path, which latter preferably has laterally disposed upwardly inclined guard-ribs at opposite sides of said notches and merging into the top of the bobbin-cavity wall upon the side toward which the thread-loops are carried from the needle in the loop-casting operation.

The thread-case is provided with a substantially radial lug engaging a stationary part of the machine for maintaining the thread-case against rotation, an upwardly inclined guard extending to the top of said lug being provided on the side thereof toward which the thread-loops are cast.

In the drawings, Figure 1 is a sectional side elevation, and Fig. 2 a bottom plan view of a sewing machine provided with the present improvements. Fig. 3 is a perspective view of the loop-taker and a portion of the sewing machine bed-plate. Fig. 4 is a plan of the loop-taker with the throat-plate. Fig. 5 is a transverse section of the loop-taker, and Fig. 6 a similar view taken at right angles with the section-plane of Fig. 5. Figs. 7 and 8 are perspective views of the thread-case and the hook, respectively, and Fig. 9 is a similar view of the raceway cover of the hook. Fig. 10 is an elevation showing a modification of the loop-taker driving means represented in Fig. 1.

As represented in the drawings, the machine is constructed with the usual bed-plate 1 having the bracket-arm comprising the hollow standard 2 and the overhanging tubular member 3 in which is journaled the main-shaft 4 having operatively connected with its forward end by usual or suitable means the reciprocating needle-bar 5 carrying the needle 6. The main-shaft 4 has secured thereon in its rearward portion the hub of the bevel pinion 7 meshing with a similar pinion 8 upon the upper end of the vertical shaft 9 journaled within the standard 2 and carrying at its lower end the bevel-pinion 10 meshing with a similar pinion 11 fixed upon the rearward end of the horizontal shaft 12 journaled in suitable

bushings 13 and 14 of the depending bearing members 15 and 16 of the bed-plate.

Journaled within the vertical bearing boss 17 of the bracket 18 depending from the forward portion of the bed-plate is the vertical loop-taker shaft 19 upon the upper end of which above the boss 17 is secured by means of the set-screw 20 the hub 21 of the bevel-pinion 22 meshing with the actuating bevel-gear 23 of twice its diameter fixed upon the forward end of the shaft 12. Fitted upon the hub of the pinion 22, and secured thereon by means of the set-screw 24 is the apertured boss 25 depending from the bottom 26 of the cup-shaped hook 27.

The body of the hook is provided at its upper edge with the annular flange 28 within which the cylindrical wall is formed with the open-topped annular raceway 29. The rim of the hook-body is formed with the inwardly extending loop-seizing beak 30 provided exteriorly at the base with a shoulder 31 over which is secured the needle-guard plate 32 to afford the usual throat for reception of the needle-thread loops seized by the beak. The rim of the hook-body is provided adjacent the shank of the hook with a flat seat 33 and at the heel with a seat 34 between which the upper edge of the hook-body is slightly cut out to form a depression below said seats, as represented in Fig. 8. Upon the seat 34 is secured by means of screws 35 the resilient segmental cover-plate 36 provided at one end with the screw-apertures 37 to receive the screws 35 and at the reduced opposite end with the taper finger 38 resting upon the seat 33 beneath the hook-shank. The cover-plate 36 serves to close the upper side of the raceway 29, and is adapted to yield adjacent the beak to prevent the clogging of said raceway by accidental introduction of threads or other matter which may be ejected through the slit 39 afforded between the depressed upper edge of the hook-body and the cover plate, as represented in Figs. 5 and 6, the hook being outwardly beveled in such portion, as represented particularly in Fig. 8.

The bottom of the hook-body is entirely closed to prevent deposit in the intermeshing gears 22 and 23 of lint and dirt which may be collected therein in the stitching operation, such substances being readily thrown out by centrifugal action through the lateral apertures 40 of the hook-body. The part 27′ of the side wall of the hook-body intermediate the beak and heel has an inner face flush with the inner face of the beak 30, and affords a needle-guard to prevent collision of the point of the beak with the needle in the loop-seizing operation.

The thread-case is shown constructed with the disk-body 41 peripherally fitted within the raceway 29 and provided in its edge with the thread-clearing notches 42. It is provided upon one side with the usual recess or pocket 43 and eccentrically to its axis with the open-topped bobbin-cavity 44 having at the bottom and below the disk 41 the inwardly extending flange 45 for sustaining the lower flange of the disk-bobbin 46 carrying the lower or locking thread. The wall of the cavity 44 extends upwardly above the disk-body 41 and is provided in its upper edge with the diametrically opposite finger-notches or recesses 47 and 48 arranged substantially upon a diameter at right angles to that passing through the pocket 43 and the needle-path. These finger-notches extend down below the upper flange of the bobbin 46 to enable the latter to be easily grasped by the thumb and finger of the operator when the bobbin is in normal operative position in the thread-case.

Upwardly inclined loop-deflecting guard-ribs 49 and 50 extend from the upper face of the disk-body 41 to the top of the bobbin-cavity wall upon opposite sides of the finger-notch 47. The operative edges of these ribs act to direct the upper limb of the thread-loops over the rim of the upper bobbin-flange in the loop-casting operation.

The wall of the bobbin-cavity above the disk 41 is formed opposite the pocket 43 with the downwardly inclined thread-slit 51 terminating in the enlargement 52, the slit 51 being covered by the tension-spring 53 secured to said wall by the fastening screw 54 and the adjusting screw 55 in the usual manner. The thread-case is threaded by drawing the thread upon the top of the side wall of the cavity through the slit 51 in the aperture 52 and under the tension-spring 53 from beneath which it issues through the notch 56 in the upper edge of the bobbin-cavity wall.

The bobbin-cavity wall has projecting in a substantially radial direction therefrom adjacent the pocket 43 the lug 57 whose extremity enters the notch 58 in the forward edge of the holding bar 59 secured by screws 60 to the bottom of the bed-plate and adapted to restrain the thread-case against turning with the hook. The bar 59 is formed with a second notch 61 to provide clearance for the needle.

In the loop-casting operation, the upper limb of the needle-thread loop encounters the bobbin-thread issuing from the notch 56 and initially carries it across the thread-case to a position adjacent the needle-path. In order to prevent the bobbin-thread from accidental introduction beneath the holding lug 57, the latter has upon its side toward which the thread-loops are cast the lateral guard-rib 62 formed with upwardly inclined upper face or edge extending to the top of said lug whereby the lower thread end is deflected upwardly over such lug in the initial stitch-forming operation. This rib

joins the lug 57 intermediate its inner and outer ends and extends from the top of the body-flange 41 so as to insure proper engagement with the thread.

As represented more particularly in Figs. 1 and 4, the hook-body is so disposed and the thread-case so formed, that the entire bobbin-cavity is exposed laterally beyond the edge of the throat-plate 63, so that, by the mere withdrawal of the bed-plate slide 64 normally covering the same, the bobbin is accessible to the operator who is able to remove a bobbin for replacement by another or for other purposes by merely reaching in and grasping the upper flange of the bobbin and withdrawing the same without the employment of an ejector which has previously been required with loop-takers of the present type.

In the operation of the machine, the thread-loop presented by the needle is seized by the beak 30 within the pocket 43 and subsequently engaged by the inwardly inclined loop-dividing shoulder 41′. The lower limb is thence deflected by the rib 44′ beneath the bottom of the bobbin-cavity, and the upper limb is similarly deflected over the bobbin-cavity by the action of the guard-ribs 49 and 50.

As before indicated, in the case of the initial stitch of a series the loose end of the lower thread is carried across the thread-case by the needle-thread loop and is deflected upwardly over the lug 57 and carried ultimately through the needle-hole 65 of the throat-plate to the under face of the work. The lead of the lower thread thereafter remains fixed between the notch 56 in the top of the thread-case wall and the needle-hole 65, the guard-rib 62 having accomplished its purpose in the initial stitch-forming action.

In order to secure greater compactness and certain other advantages, the modified train of loop-taker actuating mechanism represented in Fig. 10 may be employed. In this case the main-shaft 4 carries the larger bevel-gear 7′ meshing with the bevel-pinion 8 of the vertical shaft 9 which is connected by the miter-gears 10 and 11 with the lower shaft 12 which is in turn connected by the miter-gear 23′ with the gear 22 which is in practice secured to the vertical hook-shaft.

From the foregoing description it is obvious that the present improvement is not limited to the specific construction and arrangement of parts herein shown and described, but may be varied materially therefrom within the scope of the invention.

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

1. In a sewing machine, the combination with a throat-plate having a needle aperture, and a needle reciprocating through said aperture, of a rotary hook-member having an axial cavity beneath the throat-plate on one side but otherwise exposed beyond one edge of the same, means for imparting to it a plurality of rotations for each reciprocation of the needle, a thread-case journaled in said member and having a bobbin-cavity disposed eccentrically to said member on the side thereof farthest from the needle-path and wholly exposing said bobbin-cavity laterally of the adjacent edge of the throat-plate, and a bobbin within said cavity.

2. In a sewing machine, the combination with a reciprocating needle, of a loop-taker shaft disposed substantially parallel with said needle, a fixed bearing in which said shaft is journaled, a gear fixed upon said shaft and having an upwardly extending hub, a cup-shaped hook-member formed with a depending hub fitted to and secured upon the hub of said gear, and actuating means for said hook-member including a gear meshing with the first-named gear.

3. In a sewing machine, the combination with a reciprocating needle, of a circularly movable cup-shaped hook-member provided with a loop-seizing beak movable in a path embracing the needle-path and provided beneath said beak with a segmental needle-guard flange movable in a path exterior to and embracing the needle-path, and a thread-case journaled in said hook member.

4. In a sewing machine, the combination with a reciprocating needle, of a circularly movable cup-shaped hook-member having a loop-seizing beak and formed in its inner face with an annular open-topped raceway and with adjacent circumferentially separated seats of which one is disposed near the base of the beak with an intervening depression below the faces of said seats, a non-rotary thread-case peripherally fitted to said raceway and provided with a bobbin-cavity to receive a bobbin, and a resilient cover-plate for said raceway secured to one of said seats more remote from the beak and resting upon the other of said seats adjacent the beak.

5. In a sewing machine, the combination with a reciprocating needle, of a hook-member circularly movable upon a vertical axis, a thread-case journaled in said hook-member and formed with an open-topped bobbin-cavity having its side wall recessed in the upper end to expose the edge of a bobbin therein, a disk-bobbin within said bobbin-cavity, and means for restraining the thread-case against rotation.

6. In a sewing machine, the combination with a reciprocating needle, of a hook-member circularly movable upon a vertical axis, a thread-case journaled in said hook-member and formed with an open-topped bobbin-cavity having its side wall oppositely recessed at the top upon a diameter transverse to that intersecting the needle-path for

exposure of the edge of a bobbin therein, a disk-bobbin within said bobbin-cavity, and means for restraining the thread-case against rotation.

7. In a sewing machine, the combination with a reciprocating needle, of a hook-member circularly movable upon a vertical axis, a thread-case constructed with a disk-body journaled in said hook-member with an open-topped bobbin-cavity having a side wall projecting above said body and oppositely recessed at the top upon a diameter transverse to that intersecting the needle-path for exposure of the edge of the bobbin therein, a disk-bobbin within said bobbin-cavity, and means for restraining the thread-case against rotation.

8. In a sewing machine, the combination with a reciprocating needle, of a hook-member circularly movable upon a vertical axis, a thread-case constructed with a disk-body journaled in said hook-member with an open-topped bobbin-cavity having a side wall projecting above said body and oppositely recessed at the top upon a diameter transverse to that intersecting the needle-path for exposure of the edge of the bobbin therein, upwardly inclined loop-deflecting guard-ribs extending to the top of the bobbin-cavity wall upon the loop-casting side of the thread-case, a disk-bobbin within said bobbin-cavity, and means for restraining the thread-case against rotation.

9. In a sewing machine, the combination with a reciprocating needle, of a hook-member circularly movable upon a vertical axis, a thread-case constructed with a disk-body journaled in said hook-member with an open-topped bobbin-cavity having a side wall projecting above said body with a substantially radially projecting lug having upon the side toward which the thread-loops are cast a lateral guard-rib with an upwardly inclined upper face extending to the top of said lug, and a fixed holding element engaging said radial lug for restraining the thread-case against rotation.

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

MARTIN HEMLEB.

Witnesses:

HENRY J. MILLER,

HENRY A. KORNEMANN, Jr.