M. HEMLEB.

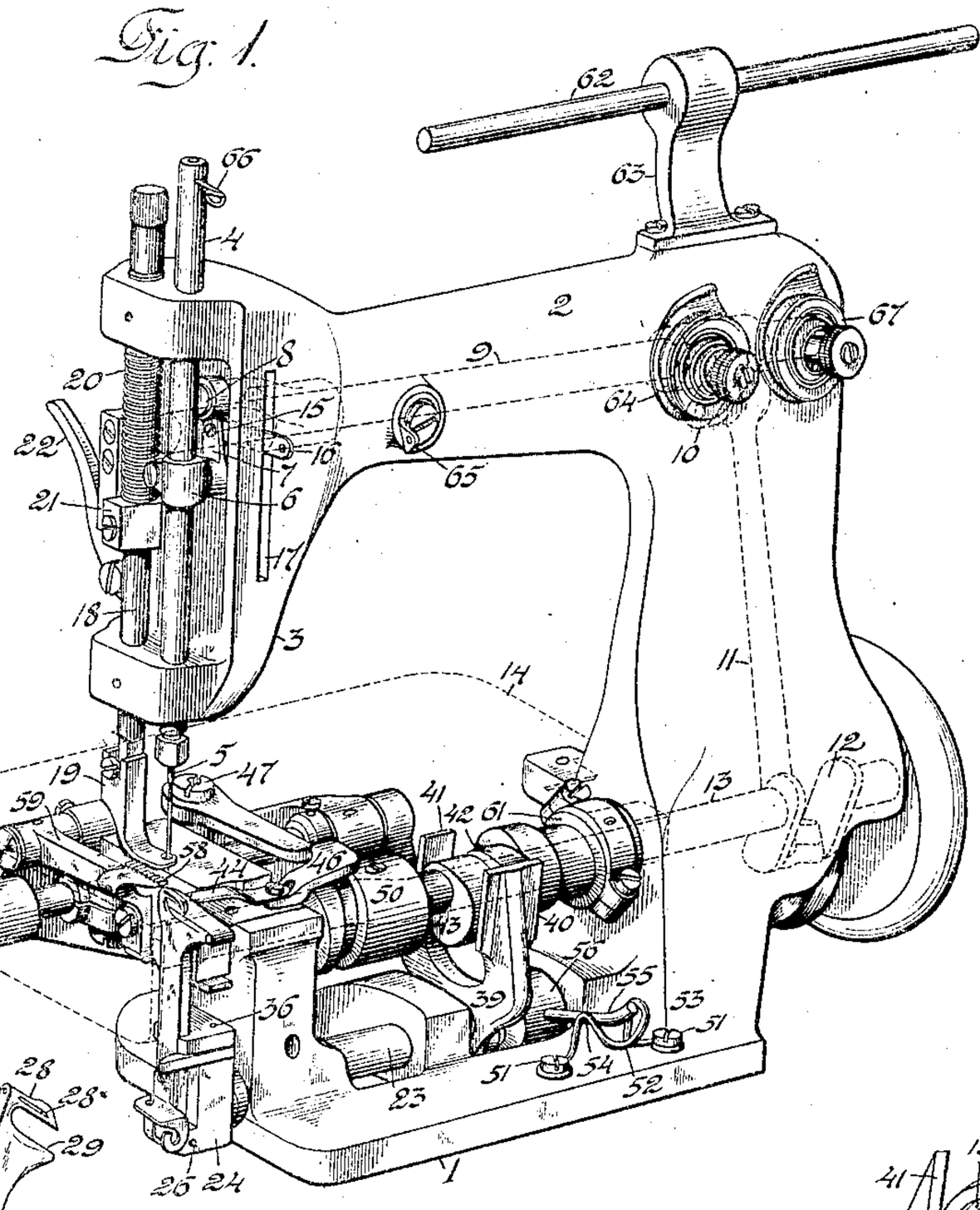
SEWING MACHINE.

APPLICATION FILED OCT. 30, 1908.

924,903.

Patented June 15, 1909.

Fig. 1.



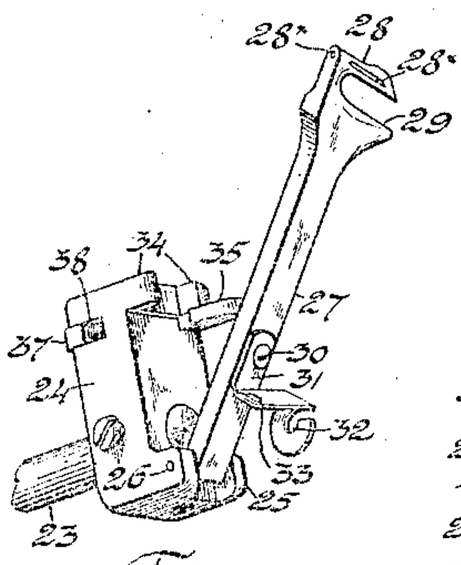


Fig. 3.

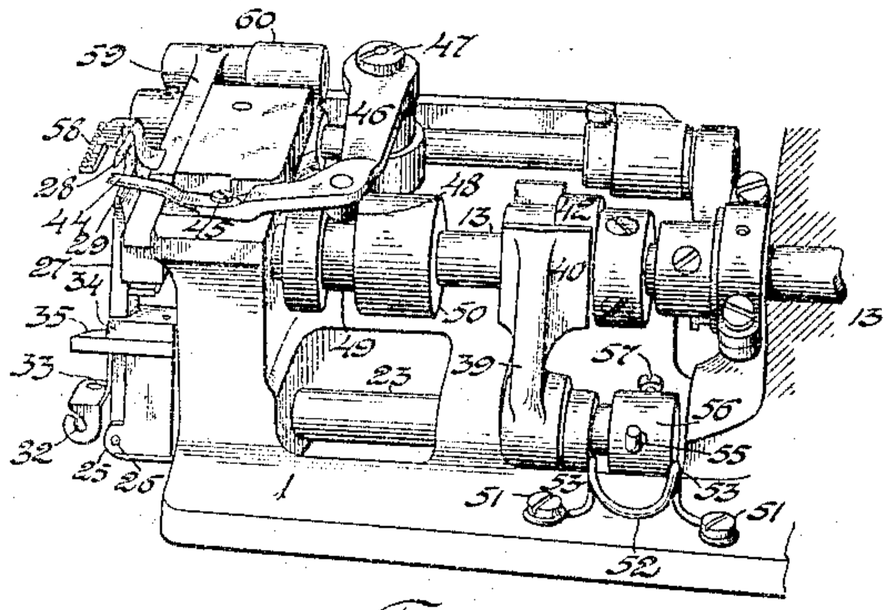


Fig. 2.

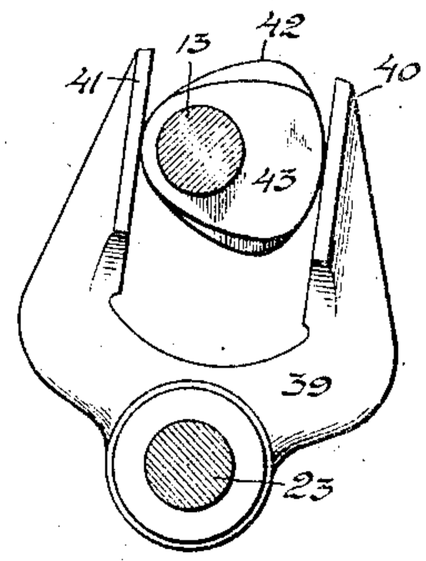


Fig. 4.

WITNESSES

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SEWING-MACHINE.

No. 924,903. Specification of Letters Patent. Patented June 15, 1909.

Application filed October 30, 1908. Serial No. 460 199.

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-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to provide a simple and effective stitch-forming mechanism for producing a double chain-stitch in connection more particularly with machines for stitching gloves of silk or other woven material.

As herein represented, the present invention is embodied in a machine of the general style of the well-known Singer No. 24 machine, in which the main-shaft is journaled within the base beneath the work-plate and is provided at its rearward end with a crank having a pitman connection with a lateral crank-arm of the needle-actuating rock-shaft journaled in the overhanging bracket-arm and having a driving relation with the forward end of the needle afforded by a crank-and-pitman connection with the needle-bar. The looper is mounted rigidly upon the forward end of a supporting rock-shaft journaled in the bed beneath the main-shaft and having an upwardly extending yoke whose spaced parallel members engage upon opposite sides two adjacently arranged cams of equal throw with concentric outer and inner portions of different lengths, the angular extent of the concentric outer portion of one cam corresponding with that of the inner concentric portion of the other cam. A reciprocating spreader is provided to engage the looper-thread above the looper and carry it crosswise of the looper path in spreading it for the subsequent descent of the needle.

By the particular form of looper actuating cams above described, with the outer concentric portion of the wider cam disposed in the direction of movement of the looper in seizing the needle-thread loops, the looper is given a long dwell in its advance position after seizing a needle-thread loop, in order that the spreader may have time to seize the looper-thread and spread the same for the subsequent descent of the needle, while the retrograde movement of the looper and its advance for a succeeding needle-thread-loop seizure is effected rapidly and with but slight dwell in the reversal of its to-and-fro movements. It has been found that, with the described form of open cam mechanism for the looper actuation, the crank-and-pitman connections intermediate the main-shaft and the needle-bar provide a suitable timing for proper coöperation of the needle with the lower thread handling mechanism.

The present invention includes certain other features which will be hereinafter described and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a sewing machine embodying the present improvements, with the work-plate and the face-plate of the bracket-arm removed to expose the parts covered thereby, and Fig. 2 is a similar view, from a different position, of the operative parts beneath the work-plate. Fig. 3 is a perspective view of the looper-carrier and looper with the latter shifted from normal position for threading. Fig. 4 is a detail side elevation showing the looper-actuating cam and the yoke embracing the same with their supporting shafts.

The machine frame comprises the usual base-plate 1 and overhanging bracket-arm 2 in the head 3 of which is mounted the vertically reciprocating needle-bar 4 carrying the eye-pointed needle 5 and provided intermediate its bearings with the fixed collar 6 connected by means of the pitman 7 with a crank-pin 8 carried upon the forward end of the needle-actuating rock-shaft 9 journaled in the bracket-arm and having at its rearward end a crank-arm 10 connected by means of the pitman 11 with the crank 12 in the rearward end of the main-shaft 13 journaled in the base 1 beneath the work-plate 14 in a manner well-known. Rigidly secured to the pitman 7 by means of the fastening screw 15 is a laterally extending take-up arm 16 having at its outer end the usual thread-eye and working in a vertical slot 17 in the front side of the head 3 of the bracket-arm. Journaled also in the head 3 is the usual presser-bar 18 carrying the presser-foot 19 and normally depressed by means of the spring 20 interposed between the upper bearing and the thrust-block 21 adapted for engagement by the lifting lever 22.

Beneath the main-shaft 13 and parallel therewith is journaled the looper-supporting shaft 23 provided at its outer end with a block

24 having the projecting ears 25 between which is pivoted by means of the pin 26 the shank 27 of the looper whose blade 28 is provided with the usual thread-eyes 28× in the point and heel and intermediate groove or channel for the lower thread. Beneath the looper blade 28 and extending forwardly somewhat beyond the same is a needle-guard finger 29, integral with the shank 27 and blade 28, whose upper edge is beveled forwardly and merges into the flat front face which lies substantially in the plane of the slightly offset point of the looper, as represented in Figs. 1 and 2. This needle-guard finger is provided to insure the glancing off of the needle in case it should be deflected in penetrating the work, thus insuring against collision with the advancing point of the looper in the seizure of the needle-thread loop. To the looper shank is secured by means of the screw 30 the foot 31 of a thread-guide formed with the open eyes 32 and 33 to receive the thread passing from the source of supply to the thread eyes in the looper. The block 24 is provided at the upper end with the spaced guide-lugs 34 between which the looper shank is locked by means of the angular latch-lever 35 pivoted within a slot in said block by means of a pin 36 and having interposed between its tail 37 and the inner end of said slot a spring 38 by means of which the latch is normally closed.

Upon the rearward portion of the looper-supporting shaft 23 is fixed the upwardly extending yoke 39 having the spaced parallel wearing members 40 and 41 embracing the two-part cam formed of the sections 42 and 43 fixed upon the main-shaft 13. As will be observed by reference to Fig. 4, both cam sections are of the general pattern known as "triangular" having their concentric inner and outer portions of the same height and curvature but of different extent, the length of the outer concentric portion of the wider cam 42 being of the same angular extent as the inner concentric portion of the narrower cam section 43. In other words, while differing in actual length, the angular extent of the concentric portion of greater curvature of the cam 42 corresponds with the angular extent of the concentric portion of smaller curvature (*i. e.*, that nearest the axis of the shaft 13) of the cam 43. This is true because while the member 40 of the yoke 39 is in contact with the outer concentric portion of the cam 42, or that having the greatest radius, the yoke member 41 remains in contact with the inner concentric portion, or that having least radius, of the cam 43, so that the space between the yoke members 40 and 41 will be completely occupied during the dwell of the cam in order to prevent lost motion and consequent uncertainty of control of the looper rock-shaft 23.

To distend the looper-thread between the eye of the looper and the under side of the material for passage of the needle, a notched spreading finger 44 is secured by means of a screw 45 upon the forward end of an angular lever 46 fulcrumed upon the frame of the machine by means of the screw 47 and provided intermediate the fulcrum and the spreader-finger with a roller-stud 48 entering a cam-groove 49 in a cam-cylinder 50 fixed upon the main-shaft 13.

Secured upon the base at the front of the machine by means of screws 51 is a U-shaped thread-guard 52 bent into such shape as to afford the spaced thread-guiding loops 53 and 54, intermediate which is interposed the vibrating thread take-up pin 55 having slightly upturned outer end and projecting from a collar 56 secured by means of the set-screw 57 upon the rearward end of the looper rock-shaft 23.

The feed-dog 58 carried by the feed-bar 59 is pivotally connected with an upwardly projecting arm 60 of the feed-rocker actuated by a connection with the feed-actuating eccentric 61 upon the rearward portion of the main-shaft and provided with lifting means upon the forward end of the main-shaft as in the Singer machine before referred to.

In threading the machine, the thread is taken from a spool upon the forward end of the spool-pin 62 carried by the standard 63 which is mounted upon the bracket-arm, being led through the tension device 64, thence through a fixed guide-eye 65 upon the arm 2, to the eye of the take-up arm 16, from which it is led through a guide-eye 66 upon the upper end of the needle-bar downwardly to the eye of the needle 5. The looper-thread is led from a spool upon the rearward end of the spool-pin 62 to the tension device 67, and thence under the guide-loop 53 over the take-up pin 55 and under the guide-loop 54 through the guide-eyes 32 and 33 to the thread channel of the looper.

In the operation of the machine, the needle descends and upon beginning its upward movement throws out its loop which is entered by the quick advance of the looper which pauses at its advance position to permit the engagement of its own thread by the spreader, which latter carries a bight of looper thread transversely beyond the needle path after which the needle descends through the looper-thread bight and the looper recedes to shed the previously seized needle-thread loop, returning to initial retracted position. As the looper-thread take-up finger 55 is carried by the looper rock-shaft, it will be observed that it acts to pull up the looper-thread only while the looper is receding from advance to initial retracted position, and that it gives up the looper-thread as the looper advances to seize a succeeding needle-thread loop.

It will be observed that the two-part

looper-actuating cam above described affords a cam of the "open" type, although positively acting at all times, and thus permits any dirt which may be introduced therein in the operation of the machine to become dislodged and to drop out of the same so that such cam and its follower are at all times clean and free from grit and foreign matter which would impair durability. It will also be observed, that the form of cam herein shown and described is such that the wearing faces of both cam sections and follower may be extended lengthwise of the main-shaft to any required degree so as to secure the requisite wearing surface and insure the greatest durability of the parts; while the shape of the sections is such as to provide easy movements for the looper rock-shaft although affording the requisite dwell of the looper in its advance position for the necessary cooperation of the spreader and the needle, which latter is thus enabled to be driven by the simple crank-and-pitman connections before described so as to produce a light running and noiseless machine of high speed capacity.

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

1. In a sewing machine, the combination with the frame comprising a base and an overhanging bracket-arm, and a main-shaft journaled in the base, of a reciprocating needle, a needle-actuating rock-shaft mounted upon the bracket-arm parallel with the main-shaft, crank-and-pitman connections intermediate one end of the needle-actuating rock-shaft and the main-shaft and between the other end of said rock-shaft and the needle, a looper rock-shaft journaled in the base beneath and parallel with the main-shaft, a looper fixed upon said looper rock-shaft, a two-part cam fixed upon the main-shaft and composed of adjacent sections each of triangular form with concentric outer and inner portions of equal height but of different lengths, and with the angular extent of the outer concentric portion of one cam-section corresponding with that of the inner concentric portion of the other cam section, and a yoke fixed upon the looper shaft and having spaced parallel members adapted to engage the respective cams upon opposite sides of the main-shaft.

2. In a sewing machine, the combination with the frame comprising a base and an overhanging bracket-arm, and a main-shaft journaled in the base, of a reciprocating needle, a needle-actuating rock-shaft mounted upon the bracket-arm parallel with the main-shaft, crank-and-pitman connections intermediate one end of the needle-actuating rock-shaft and the main-shaft and between the other end of said rock-shaft and the needle, a looper rock-shaft journaled in the base beneath and parallel with the main-shaft, an eyed thread-carrying looper fixed upon said looper rock-shaft, a two-part cam fixed upon the main-shaft and composed of adjacent sections each of triangular form with concentric outer and inner portions of equal height but of different lengths, and with the angular extent of the outer concentric portion of one cam section corresponding with that of the inner concentric portion of the other cam section, a yoke fixed upon the looper-shaft and having spaced parallel members adapted to engage the respective cams upon opposite sides of the main-shaft, a spreader movable transversely of the looper path above the eye of the looper in its advance position, and means upon the main-shaft for reciprocating said spreader.

3. In a sewing machine, the combination with the frame comprising a base and an overhanging bracket-arm, and a main-shaft journaled in the base, of a reciprocating needle, an operative connection intermediate said needle and the main-shaft, a looper rock-shaft journaled in the base beneath and parallel with the main-shaft, an eyed thread-carrying looper fixed upon said looper rock-shaft, a looper-actuating cam fixed upon the main-shaft, a yoke fixed upon the looper-shaft and embracing said actuating cam, a pair of spaced looper-thread guide-eyes adjacent the looper rock-shaft, and a vibratory take-up finger carried by the looper rock-shaft and movable intermediate said thread-eyes synchronously with the operative movements of the looper.

4. In a sewing machine, the combination with the frame comprising a base and an overhanging bracket-arm, and a main-shaft journaled in the base, of a reciprocating needle, an operative connection intermediate said needle and the main-shaft, a looper rock-shaft journaled in the base beneath and parallel with the main-shaft, a looper carrying block fixed upon said rock-shaft, a looper having its shank pivotally mounted in said block and provided with an integral eyed loop-seizing blade and a beveled needle-guard finger disposed beneath the same and having its operative face in substantially the plane of the point of the looper-blade, a spring-pressed latch upon the looper-carrying block adapted to normally engage the looper-shank and retain the same in operative position upon said block, a looper-actuating cam fixed upon the main-shaft, and a yoke fixed upon the looper-shaft and embracing said actuating cam.

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

MARTIN HEMLEB.

Witnesses:
HENRY J. MILLER,
JOSEPH F. JAQUITH.