P. HLEB.

SEWING MACHINE.

APPLICATION FILED OCT. 21, 1914.

1,153,429.

Patented Sept. 14, 1915.

Fig. 1.

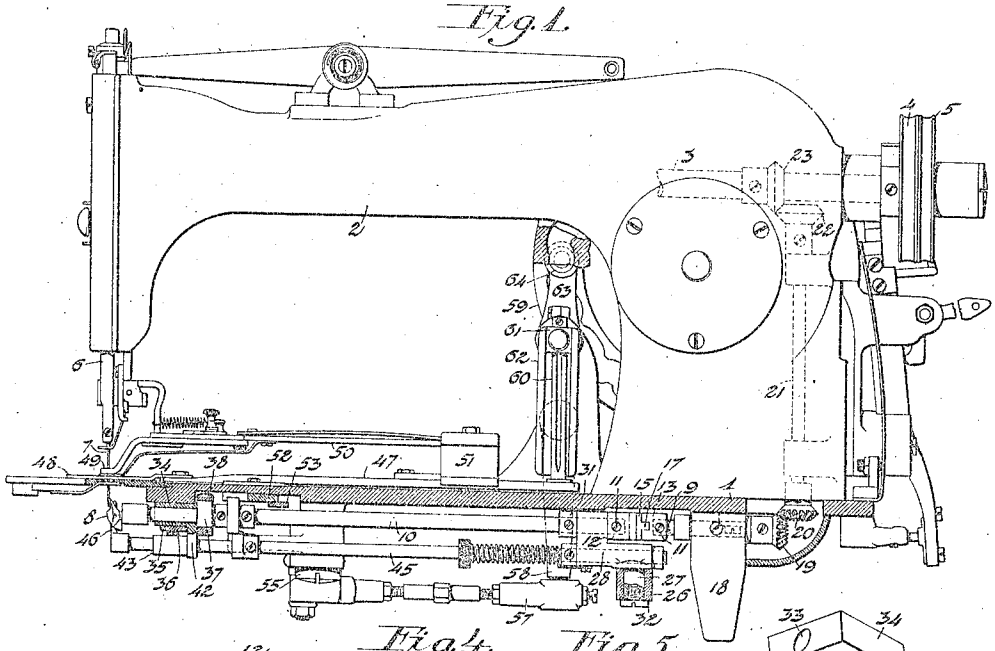


Fig. 4.



Fig. 5.

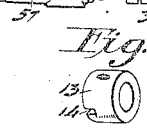


Fig. 6.

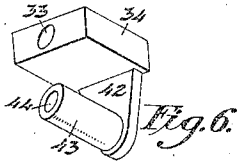


Fig. 3.



Fig. 2.

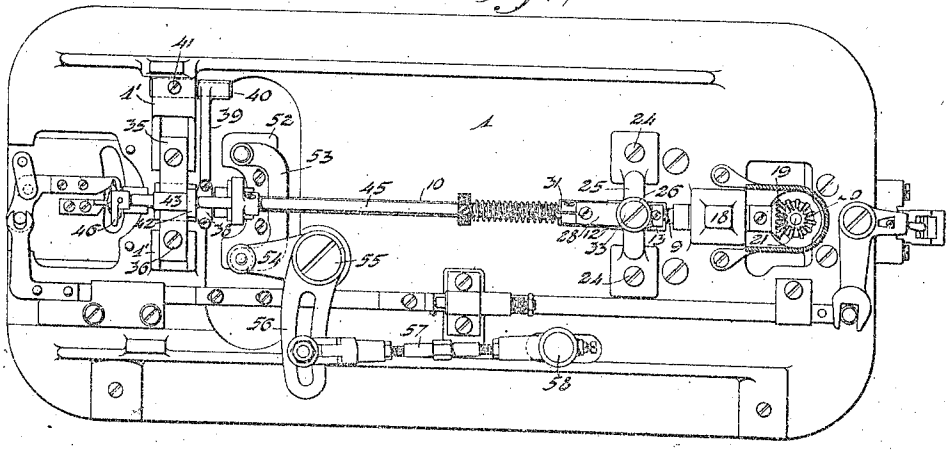


Fig. 7.

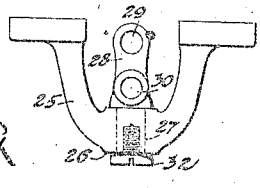
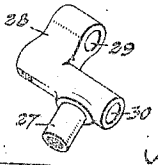


Fig. 8.



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SEWING-MACHINE.

1,153,429. Specification of Letters Patent. Patented Sept. 14, 1915.

Application filed October 21, 1914. Serial No. 867,704.

To all whom it may concern:

Be it known that I, PETER HLEB, 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 more particularly to an improvement in operating means for stitch-forming mechanism involving a rotary shaft carrying one of the stitch-forming elements and performing lateral jogging movements in its coöperation with a reciprocating needle; and it has for its object the provision of a construction in which efficient and substantial driving means may be employed which shall be unaffected by said jogging movements.

In the preferred form of the improvement the loop-taker shaft is formed in separate sections arranged end-to-end, one of the sections being mounted for movement upon a fixed axis and having the actuating means connected thereto, while the other section carrying the loop-taker is journaled at one end in a bearing block having a fulcrum whose axis is disposed transverse to and is directed intermediate the adjacent ends of said sections which are connected together for rotation in unison by a universal coupling, means being applied to the loop-taker carrying section whereby it performs jogging movements in conjunction with its turning movements, as described more fully in the pending application of Albert F. Fifield, Serial No. 828,663, filed April 1, 1914. In practice, the adjacent ends of the two shaft sections are formed with transverse grooves or slots which are entered respectively by transverse tongues upon the opposite faces of an interposed coupling block, such tongues being arranged crosswise of each other.

The primary or driving shaft-section disposed beneath the bed-plate is preferably connected by means of an intermediate vertical shaft and suitable bevel gearing with the main-shaft journaled within and longitudinally of the bracket-arm, which provides a substantial and efficient operative connection between the upper and lower shafts and permits the accurate formation of the intermeshing gears so as to insure against excessive noise and undue wear at the high speeds at which this class of machines is designed to be driven in the production of groups of overseam stitches for attaching buttons to garments and for other purposes.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, and Fig. 2 a bottom plan view of a sewing machine embodying the present improvement. Figs. 3, 4 and 5 are perspective views representing transversely slotted collars applied to the adjacent ends of the loop-taker shaft-sections and an intermediate block in the form of a disk or washer having transverse tongues upon its opposite faces. Fig. 6, is a perspective view of the sliding forward shaft-bearing. Fig. 7 is an elevation of the pivoted bearing block for the loop-taker shaft-section and the hanger upon which the same is fulcrumed, and Fig. 8 is a perspective view of said bearing block.

The machine frame is formed with the usual bed-plate 1 and overhanging bracket-arm 2 in which latter is journaled the main or driving shaft 3 carrying the fast and loose belt-pulleys 4 and 5. Connected with the main-shaft by usual or suitable means is the reciprocating needle-bar 6 carrying the eye-pointed needle 7 coöperating with the looper 8 in the production of single-chain overseam stitches, as illustrated herein.

The looper-shaft is disposed beneath the bed-plate and is formed in two sections 9 and 10 arranged end-to-end, the latter having fixed upon its forward extremity the looper 8. These shaft-sections have secured upon their adjacent ends by means of set-screws 11 the collars 12 and 13 provided upon their adjacent faces with the diametrical grooves or slots 14. The collars 12 and 13 have interposed between them the circular block or washer 15 formed upon its opposite faces with the diametrical tongues or ribs 16 and 17 arranged crosswise of each other and entering the grooves 14 of the blocks 12 and 13, respectively. The block 15 thus affords a universal coupling element between the transversely slotted adjacent ends of the shaft-sections, or collars 12 and 13 thereon, which latter permit the movement of the secondary looper-carrying sec-

tion 10 out of alinement with the primary section 9 without disturbing their operative relation, the lateral inclination of the section 10 being permitted by the free working of the coupling block 15 disposed in the plane of such inclination within its respective slot 14, while the other tongue of the coupling block serves in conjunction therewith to prevent its lateral displacement relatively to the shaft, as will be readily understood. It is of course unessential that separate collars 12 and 13 be applied to the shaft sections to receive the interlocking tongues and slots 17 and 14, respectively, the function of the loose connections thus formed being merely to couple the shaft sections together in such manner as to allow their relative free lateral movement.

The primary shaft-section 9 is journaled within a suitable bearing therefor formed in the depending lug 18 of the bed-plate, and has fixed upon its rearward end the bevel-pinion 19 meshing with the similar pinion 20 upon the lower end of the upright shaft 21 extending upwardly through the hollow bracket-arm standard and having fixed upon its upper end the bevel-pinion 22 meshing in turn with the pinion 23 fixed upon the main-shaft 3. The rotary movement of the sectional looper-shaft is thus derived from the main-shaft through bevel gearing which may be maintained in fixed relation under all conditions without impairment of any of its elements by reason of the lateral movements communicated from the lower shaft to the looper.

Secured to the bottom of the bed-plate by screws 24 is the depending yoke 25 straddling the looper-shaft and formed with a bearing boss 26 having its axis transverse to and passing intermediate the adjacent ends of the shaft sections and in substantially intersecting relation with the axes of said sections. Fitted within the bore of said boss is the depending fulcrum-stud 27 of a bearing block 28 formed with parallel shaft-apertures 29 and 30, as represented particularly in Fig. 8, the former affording a pivoted bearing for the shaft-section 10 which is confined against endwise movement therein by the collar 12 at one end and a second collar 31 at the other end secured in position by a set-screw. The fulcrum-stud 27 is confined in position in its bearing boss by means of the screw 32 tapped into the same with its head partially overlying the lower end of the bearing boss.

The forward portion of the shaft-section 10 adjacent the looper is journaled in a bearing aperture 33 of the slide-block 34 which is fitted within a transverse slide-way provided in a cross member 1′ depending from the bed-plate in which it is confined by means of the strap 35 secured in position by screws 36 substantially as represented in the said pending application. The forward portion of the shaft is thus sustained for sidewise movement in conjunction with the rotary movements derived from the main-shaft through the described connections.

The shaft-section 10 has fixed thereon near the slide-block 34, the eccentric 37 embraced by the strap 38 at one end of the connecting rod 39 whose apertured opposite end embraces the stud-pin 40 secured by means of the set-screw 41 within an aperture in the bed-plate cross-member 1′. As the strap 38 embracing the actuating eccentric 37 is maintained a fixed distance from the stationary stud-pin 40 by the connecting rod, each rotation of the shaft obviously produces a lateral jogging movement of the latter with its bearing slide-block 34, the swiveled bearing block 28 permitting the free horizontal vibratory movement of the shaft upon the stud 27 as a fulcrum.

The slide-block 34 is formed in one end with a depending lug 42 carrying the overhanging bearing boss 43 formed with the aperture 44 in which is journaled the forward portion of the needle-guard rock-shaft 45 whose opposite end portion is journaled within the bearing aperture 30 of the swivel bearing-block 28. The rock-shaft 45 carries at its forward end the needle-guard 46 and is provided with suitable actuating means, but this needle-guard mechanism forms no part of the present invention.

As represented in the drawings, the machine is provided with a jogging work-holder comprising the bar 47 having secured upon its forward end the lower work-supporting plate 48 above which is sustained the upper work-clamping member 49 by means of the spring-pressed arm 50 secured upon the block 51 which is mounted upon the rearward end of the bar 47. The bar 47 is connected by suitable means intermediate its ends with the slide-plate 52 beneath the bed-plate having a link connection 53 with one arm 54 of a bellcrank fulcrumed at 55 and provided with a slotted arm 56 which is connected in turn by means of the link element 57 with the lower arm 58 of a rock-lever depending through a suitable aperture in the bed-plate. Said rock-lever carries upon its upper arm a roller-stud entering an actuating cam-groove in the controlling cam-wheel 59 which is in practice suitably connected with the main-shaft for imparting to the work-clamp jogging movements crosswise of the bed-plate and hence in the plane of the rotary movement of the looper.

The bar 47 has upon its rearward end the upright post 60 entering a block 61 fitted within the laterally channeled arm 62 of a rock-lever having upon its upper arm 63 the roller 64 entering a suitable groove in the cam-wheel 59. When the block 61 is adjacent the fulcrum of the rock-lever 62 63, the

post 60 affords a fulcrum upon which the sidewise movements of the work-holder are performed.

The machine, as thus described, operates substantially in the manner described in the pending application Serial No. 828,663, before mentioned. In the operation of the stitch-forming mechanism, the looper performs a rotation for each reciprocation of the needle and jogging movements of the same frequency to compensate for the alternate lateral shifting movements of the work with the work-holder to insure the proper coöperation of the needle and looper in each position of the work-holder.

It is evidently immaterial to the present improvement in connection with what type of stitch-forming mechanism it is employed, and whether the rotary movements of the loop-taker shaft are continuous or oscillatory. It is evident that, while the form of universal coupling shown and described is preferable, other forms may be employed to connect the shaft sections, and that the form of coupling herein represented does not require the employment of collars 12 and 13 separate from the shaft sections. It will therefore be seen that the present improvement is not limited to the particular construction and arrangement of parts shown and described herein, but may be considerably varied without departure from the scope of the invention.

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

1. In a sewing machine, in combination, a reciprocating needle, a shaft formed in separate sections arranged end-to-end, turning means for one of said sections, a bearing for the other of said sections having a fulcrum with its axis transverse to and passing intermediate the adjacent ends of said sections, means for imparting to the second-named section lateral jogging movements upon said fulcrum, a universal coupling intermediate the adjacent ends of said sections, and a loop-taker mounted upon the second-named section of said shaft for cooperation with said needle.

2. In a sewing machine, in combination, a reciprocating needle, a shaft formed in separate primary and secondary sections arranged end-to-end, turning means for the primary section, a bearing for the secondary section having a fulcrum with its axis transverse to and disposed in substantially intersecting relation with the axes of said sections, means for imparting to the secondary section lateral jogging movements upon said fulcrum, a universal coupling intermediate the adjacent ends of said sections, and a loop-taker mounted upon the second-named section of said shaft for coöperation with said needle.

3. In a sewing machine, in combination, a reciprocating needle, a shaft formed in separate sections arranged end-to-end, turning means for one of said sections, a bearing for the other of said sections having a fulcrum with its axis transverse to and passing intermediate the adjacent ends of said sections, means for imparting to the second-named section lateral jogging movements upon said fulcrum, a coupling block disposed intermediate the adjacent ends of said sections and provided with transverse pivotal connections with each section and in angular relation each with the other, and a loop-taker mounted upon the second-named section of said shaft for coöperation with said needle.

4. In a sewing machine, in combination, a reciprocating needle, a shaft formed in separate sections arranged end-to-end, turning means for one of said sections, a bearing for the other of said sections having a fulcrum with its axis transverse to and passing intermediate the adjacent ends of said sections, means for imparting to the second-named section lateral jogging movements upon said fulcrum, a coupling block disposed intermediate the adjacent ends of said sections with which it has transverse tongue-and-slot connections each disposed transversely of the other, and a loop-taker mounted upon the second-named section of said shaft for coöperation with said needle.

5. In a sewing machine, in combination, a reciprocating needle, a shaft formed in separate sections arranged end-to-end and provided at their adjacent extremities each with a diametrical slot, turning means for one of said sections, a bearing for the other of said sections having a fulcrum with its axis transverse to and disposed in substantially intersecting relation with the axes of said sections, means for imparting to said second named section lateral jogging movements upon said fulcrum, a coupling block interposed between the ends of said sections and provided upon its opposite faces with transverse tongues each disposed crosswise of the other and entering the transverse slot of the adjacent shaft section, and a loop-taker mounted upon the second-named section of said shaft for coöperation with said needle.

6. In a sewing machine, in combination, a reciprocating needle, a work-holder, means for producing relative jogging movements between said needle and work-holder, a rotary shaft comprising separate primary and secondary sections arranged end-to-end, a fixed bearing in which the primary shaft section is journaled, actuating means for said primary shaft section, a bearing for the secondary section having a fulcrum with its axis transverse to and disposed in substantially intersecting relation with the axes of said sections, a loop-taker mounted upon the

secondary shaft section and coöperating with the needle in the production of stitches, means for imparting to the secondary section lateral jogging movements upon said fulcrum, and a universal coupling intermediate the adjacent ends of said sections.

7. In a sewing machine, the combination with the frame comprising a bed-plate and a bracket-arm including a hollow standard and an overhanging tubular portion, of a main-shaft journaled in the bracket-arm, a loop-taker shaft formed in separate primary and secondary sections arranged end-to-end and disposed beneath the bed-plate, a fixed bearing beneath the bed-plate for the primary shaft section, a driving connection embraced by said standard between the main-shaft and said shaft section, a hanger rigidly connected with and depending from the bed-plate and having a bearing boss with its axis transverse to and passing intermediate the adjacent ends of said sections, a bearing block affording a support for the secondary shaft section and having a depending fulcrum-stud fitted within said bearing boss, means for imparting to the secondary section lateral jogging movements upon said fulcrum, and a universal coupling intermediate the adjacent ends of said sections.

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

PETER HLEB.

Witnesses:
HERMANN EICHHORN,
HENRY A. KORNEMANN, Jr.