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SEWING-MACHINE LOOPER MECHANISM.

Application filed March 14, 1922. Serial No. 543,735.

To all whom it may concern:

Be it known that I, ANDREW B. CLAYTON, a citizen of the United States, residing at Union, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machine Looper Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in looper-actuating mechanisms for sewing machines and particularly to improvements in the looper-actuating mechanism disclosed in the United States patent to Albert H. Devoe, No. 1,100,124, dated June 16, 1914.

The present invention has for an object to provide looper-actuating mechanisms of the character disclosed in said patent with means whereby the time of coaction of the looper with the sewing machine needle and its lateral position with respect thereto may be readily determined and adapted to meet different sewing conditions.

Another object of this invention is to provide a looper-mechanism of the character referred to with supporting and actuating means so constructed and arranged as to permit of their ready removal from the machine in whole or in part without disturbing the looper-mechanism actuating shaft or the other actuating elements carried by said shaft.

Other objects of the invention will be apparent from the following description and claims.

In its preferred embodiment, the present invention comprises a looper-actuating mechanism in which one or more loopers are carried by a looper-clip secured upon a looper-carrier in a manner permitting bodily lateral adjustment of the positions of the loopers. The looper-carrier is adjustably clamped upon a looper-carrier support, fulcrumed for reciprocatory-oscillatory movements and socketed to slidingly receive a pin depending from a sleeve embracing an inclined crank. The inclined crank is carried by a crank-shaft secured at one end upon a rotary actuating shaft and journaled at its opposite end in a suitable bearing provided in a bracket detachably secured upon the machine frame. The fulcrum for the looper-carrier support comprises a journaled bar constructed in separable sections and the sleeve embracing the inclined crank comprises split sections both in order to facilitate assembling and removal of the parts.

In the accompanying drawings, Fig. 1 is a front side elevation, partly in section, of a portion of a chain-stitch sewing machine embodying the present improvement. Fig. 2 is a front end elevation, partly in section, of the same. Fig. 3 comprises detailed perspective views, partly in section, of the loopers, their support and carrier, the crank-embracing sleeve and its laterally projecting pin. Fig. 4 is a sectional view substantially on the line a—a of Fig. 1.

Referring to the drawings, the sewing machine is shown as constructed with the base 1 sustaining an overhanging arm terminating in the head 2. Journaled for vertical, reciprocatory movements in the head 2 is the needle-bar 3, carrying needles as spaced from each other in the direction of the feed of the material being operated upon. Also mounted for vertical movements in the head 2 is the presser-bar 5 carrying the presser-foot 6 opposed to the feed-dog 7, which latter may be supported and actuated in any approved manner.

Journaled in a suitable bearing provided in an upstanding lug 8 on the machine base is a rotary actuating shaft 9 having a reduced forward-end portion 10 adjacent the lug 8. Embracing said reduced shaft end 10 is the tubular end 11 of a crank-shaft. The outer surface of the end 11 of the crank-shaft is formed as eccentric to the axis of rotation of the shaft and is embraced by a strap 12, which through suitable connections (not shown) transmits rising and falling movements to the feed-dog 7. The tubular end 11 of the crank-shaft is secured upon the reduced actuating-shaft end 10 by means of a screw 13, access to which is afforded by an aperture 14 provided in the strap 12. The securing screw 13 therefore affords means permitting the correct determination of the crank position of the crank-shaft upon and with respect to the actuating shaft.

Adjacent its tubular end 11, the crank-shaft is provided with a head 15 from whose inclined forward face projects an inclined
looper-actuating crank-pin 16, which serves as the sole actuating element for imparting both endwise and sidewise movements to the looper. Preferably formed integral with the opposite end of the crank-pin 16 is another inclined head 17 carried by the forward end 18 of the crank-shaft. The end 18 of the crank-shaft is journaled in a suitable bearing provided in a bracket 19 detachably secured, by means of a screw 20, upon a seat provided in an upstanding lug 21 on the machine base. It will be apparent that, by manipulation of the securing screws 20 and 13, the crank-shaft may be removed from the machine without disturbing the actuating shaft 9, which latter shaft usually carries a number of other actuating elements whose relative timing positions would be destroyed were it necessary to withdraw said actuating shaft in order to remove the crank-shaft, as was the case in prior constructions of this character.

Fitted upon the inclined crank 16 are the upper and lower split-sleeve sections 22 and 23 united by securing screws as 24. Depending from the lower sleeve section 23 is a tubular pin 25 slidingly fitted within a socket 26 of an oscillatory and bodily-reciprocatory looper-carrier support 27. The lower end of the socket 26 is closed by means of a screw 28, threaded therein. The looper-carrier support has a head 29 carrying a peripherally threaded extension 30. The looper-carrier support 27 is formed or otherwise provided with an abutment-web 31 adapted to be engaged upon opposite sides thereof by adjusting screws, as 32, threaded into spaced lateral ears, as 33, on the lower end of a looper-carrier 34. The looper-carrier 34 is provided with an aperture 35 entered by the extension 30 upon which extension is then threaded a tubular bar 36 for clamping the carrier between the end of the bar 36 and the head 29. The bar 36 is journaled for endwise sliding and for oscillatory movements within a bushing 37 suitably secured in an aperture provided in a lug 38 on the base 1.

The upper face of an offset lug 39 of the looper-carrier is provided with a rib 40 and a threaded aperture 41 for the purpose of adjustably securing thereupon the grooved base of a looper-clamp 42 by means of a screw 43 and an enlarged aperture 44 in said looper-clamp base. Secured by means of set-screws, as 45, in suitable apertures, as 46, provided in the looper-clamp are the shanks 47 of loopers, as 48, positioned so that the paths of their endwise movements lie in a direction transverse to the direction of feed.

In operation, each of the two loopers 48 cooperates with its respective needle 4 in the manner described in the construction disclosed in the prior DeVoe Patent No. 1,100,124, hereinafore referred to. The improvement in the present construction resides in the adjustments provided for correctly positioning the loopers with respect to the needles to insure proper coaction under different sewing conditions. It is apparent that by slightly nutthreading the bar 36 and then adjusting the screws 32 it is possible to correctly position the loopers in an endwise direction, whereby the time of coaction with the needles may be altered independently of the looper-actuating element. It is also apparent that the enlarged aperture 44 in the looper clamp permits bodily sliding movement thereof upon the rib 40, whereby accurate adjustments of the lateral position of the loopers may be obtained.

Another and very important feature of the present improvement resides in the construction permitting removal of the looper mechanism in whole or in part without disturbing the actuating shaft and therefore the other actuating elements usually carried by said shaft. To this end, the bracket 19 is detachably secured upon the machine frame; the sleeve sections 22 and 23 are separable; the looper-carrier 34 is detachably secured upon the looper-carrier support 27; the looper-clamp is detachably secured upon its carrier, and the crank-shaft is removably secured upon its actuating shaft, all as herein described.

In order to properly lubricate the parts comprising the looper mechanism, the lug 38 is provided with a lubricant reservoir 49 (shown in dotted lines in Fig. 2) from which a lubricant is free to pass to the outer surface of the bar 36. The tubular bar 36 has a plurality of radial apertures as 50, through which the lubricant enters the hollow bar, the outer end of the bushing 37 being closed by cap-plate 51 suitably secured upon the lug 38. Inasmuch as the extension 30 is provided with a central bore 52, the lubricant is free to work its way within the bore of said extension and into a duct 53 which communicates with the socket 26 to lubricate the bearing surface of the pin 25. The pin 25 is provided with a longitudinal bore 54 whereby the lubricant is free to pass within the sleeve embracing the crank. The bracket 19 is also provided with a reservoir 55 (shown in dotted lines in Fig. 1) communicating by means of a duct 56 with the outer surface of the end 18 of the crank-shaft which is journaled in said bracket 19. By means of a radial aperture, lubricant is conducted into a bore 57 within said shaft and through a similar bore 38 in the head 17 into a bore 59 within the crank-shaft 16. The outer end of the shaft end 18 may be closed by a cap similar to cap 51 or by any other suitable means. A plurality of suitable radial apertures lead the lubricant from the bore 59 to the outer surface of the crank-pin. By the means described,
a thoroughly efficient lubricating system is provided.

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 looper, a looper-clamp, a looper-carrier, means for adjustably securing the looper-clamp upon said looper-carrier, a looper-carrier support, means for adjustably securing the looper-carrier upon said support, and looper-actuating means operatively connected with said looper-carrier support for imparting endwise and sidewise movements to the looper.

2. In a sewing machine, the combination with a reciprocating needle and a rotary actuating shaft, of a looper mechanism comprising a crank carried by said shaft, a looper-carrier, a looper mounted upon said carrier, and operative connections between said crank and said looper-carrier for imparting both endwise and sidewise movements to said looper including a support for said looper-carrier, permitting detachment of said looper mechanism from the sewing machine in the operative position of said actuating shaft.

3. In a looper mechanism for sewing machines, the combination with an actuating shaft, and an inclined crank carried by said shaft, of a looper-carrier support journaled for oscillatory movement upon and for bodily movement along a fixed axis, a looper-carrier support having an abutment web, an oscillatory and axially slidable journal-bar detachably secured upon said support, a journal for said bar, a looper-carrier detachably mounted upon said support for movement therewith, and a looper support for imparting operative movements to said looper.

4. In a looper mechanism for sewing machines, the combination with an actuating shaft, and an inclined crank carried by said shaft, of a looper-carrier support journaled for oscillatory movement upon and for bodily movement along a fixed axis, a journal-bar constituting a fulcrum for said support detachable therefrom, a detachable looper-carrier secured upon said support, a looper support secured upon said support, and a connection between said crank and said support for imparting operative movements to said looper.

5. In a looper mechanism for sewing machines, the combination with an actuating shaft, and an inclined crank carried by said shaft, of a looper-carrier support journaled for oscillatory movement upon and for bodily movement along a fixed axis, a journal-bar for said support detachable therefrom, a looper-carrier clamped upon said support by said journal-bar, a looper support secured upon said support, and an operative connection between said support and the support for imparting operative movements to said looper.

6. In a looper mechanism for sewing machines, the combination with an actuating shaft, and an inclined crank carried by said shaft, of a looper-carrier support journaled for oscillatory movement upon and for bodily movement along a fixed axis, a pin-and-sleeve connection between said support and the inclined crank, a journal-bar for said support detachable therefrom, a looper-carrier secured upon said support for adjustment about the axis of said journal-bar, and a looper-clamp secured upon said support for adjustment about the axis of said journal-bar.

7. In a sewing machine, the combination with a base, a reciprocating needle, and a rotary actuating shaft journaled in said base, of a crank-shaft secured upon one end of said rotary shaft to rotate coaxially therewith, a bracket detachably secured upon said base affording a journal for the other end of said crank-shaft, a looper-carrier support, a pin-and-sleeve connection between the crank-shaft and said support, an oscillatory and axially slidable journal-bar detachably secured upon said support, a journal for said bar, a looper-carrier detachably mounted upon said support for movement therewith, and a looper support for imparting both endwise and sidewise movements to the looper.

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

ANDREW B. CLAYTON.