No. 673,323. Patented Apr. 30, 1901.

L. ONDERDONK.

LOOPER MECHANISM FOR SEWING MACHINES.

(Application filed Nov. 23, 1896. Renewed Sept. 21, 1900.)

(No Model.)

Fig. 1.

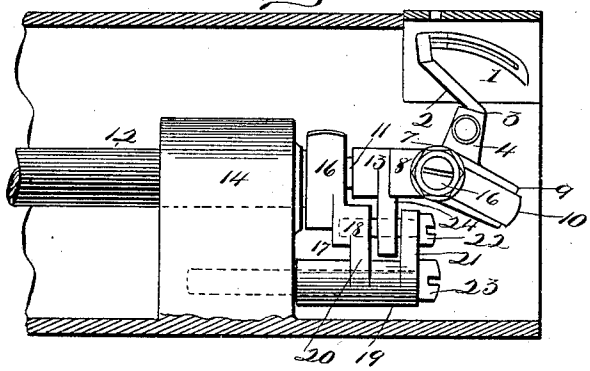


Fig. 2.

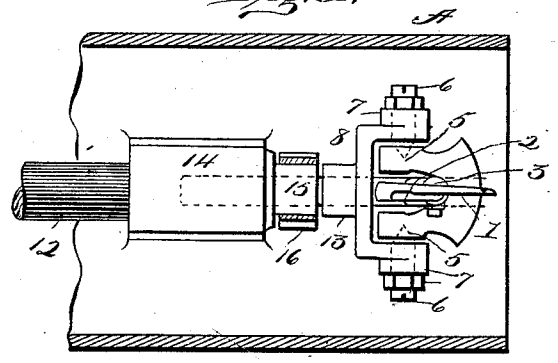


Fig. 3.

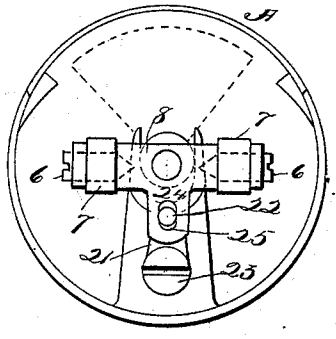


Fig. 4.

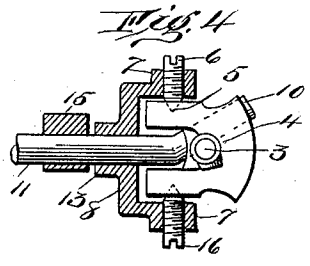


Fig. 5.

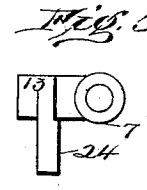
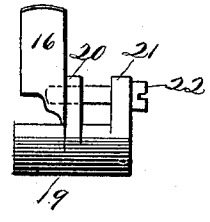


Fig. 6.



Witnesses:
J. M. Fowler Jr.
Grace Goodman.

Inventor:
Lansing Onderdonk
By Chas. A. Sturtevant
Atty.

UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF WINTHROP, MASSACHUSETTS, ASSIGNOR TO UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

LOOPER MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 673,323, dated April 30, 1901.

Application filed November 23, 1896. Renewed September 21, 1900. Serial No. 30,720. (No model.)

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, a citizen of the United States, residing at Winthrop, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

My invention relates to an improvement in double-chain-stitch sewing-machines, and has for its object to provide a machine of this class in which the looper mechanism will be compact and simple in construction and at the same time strong and positive in operation, so as to be well adapted for the high speed now demanded by the manufacturing trade.

It has been proposed to construct a looper-operating mechanism comprising a rocking looper-carrier pivotally mounted in a pivoted yoke, the pivot of the yoke being at a right angle to the pivot of the looper-carrier. In said construction the looper driving-shaft has at its forward end an eccentric and crank, the said eccentric working in a yoke or opening formed in the looper-carrier, and thereby serving to impart positive lateral movements to the latter, together with its pivoted supporting-yoke, while the crank works between flanges formed on the looper-carrier, the resultant of the actions of the crank and eccentric being to give the desired four movements to the looper, all as illustrated in Patent No. 568,702, granted September 29, 1896, to Albert Rontke. So also it has been proposed, as shown in the patent to Rudolf Stocker, dated May 25, 1897, No. 583,391, to provide a bodily-moving carriage transverse to the driving-shaft, a pivoted looper-carrier whose pivotal axis is substantially parallel with the plane of bodily movement of the carriage, a looper on said carrier with its longitudinal axis transverse to its pivotal axis, and a connection between the driving-shaft and the looper-supporting mechanism applied directly in the line of pivotal support of the carrier, whereby the parts will be evenly balanced, thereby enabling said carrier to run with a minimum of friction and vibration.

It is the main object of my invention to provide a new arrangement for supporting and operating said yoke.

My invention includes therefore, primarily, a pivoted oscillating frame and a looper-carrier supporting-yoke pivotally attached to said oscillating frame.

Secondly, it consists of an arrangement for freely connecting the yoke with the part which transmits motion from the driving-shaft to it.

Thirdly, it consists in providing on the forward end of the driving-shaft a crank and eccentric for giving the movements to the looper-carrier and yoke, the yoke being pivoted on the shaft or a part of it, such as the shank of the crank.

Again, it comprises various details of construction and arrangements of parts, all as hereinafter referred to in the appended claims.

In the accompanying drawings, which illustrate the invention, Figure 1 is a side elevation of a sewing-machine with my invention applied, so much of the machine being shown as is necessary to a complete understanding of my invention. Fig. 2 is a top plan view, partly in section, of Fig. 1. Fig. 3 is an end view with the looper-carrier removed, illustrating the arrangement of the supporting-yoke. Fig. 4 is a top plan detail view, partly in section, of the yoke and looper-carrier. Fig. 5 is a detail side view of the pivoted yoke, and Fig. 6 is a detail side view of the arrangement for giving the oscillatory free motion to the pivoted yoke.

In the drawings, A represents a portion of the bed-plate of a sewing-machine, herein shown as cylindrical in shape; but it will be understood that I do not wish to be limited in this application to any special form of bed-plate, number of loopers, direction of feed, &c. The ordinary thread-carrying looper is shown at 1 and has a shank 2 secured within a socket 3 on a frame or carrier 4, which may have opposite trunnions, or, as herein shown, has cone-shaped recesses 5 fitting over cone-screws 6, carried by the ends 7 of a yoke 8. This carrier 4 has forwardly-projecting flanges or wings 9, between which is embraced the inclined or bent crank-pin 10, having a shank 11 attached to the forward end of a shaft 12,

and in the rotation of said shaft the looper carrier or frame 4 oscillates on the cone-screws 6. The yoke 8 has a rearwardly-extending sleeve 13, embracing the shank 11 of the bent pin 10, and by this arrangement a fulcrum or pivoted support is provided for the yoke 8 upon the pin, which in this instance is practically a part of the shaft, being rigidly connected therewith, the yoke swinging on the same as a pivot or point of support, and it will be understood that hereinafter where I refer to the yoke as fulcrumed or pivoted on the driving-shaft I mean the driving-shaft or an extension thereof. The driving-shaft has its forward bearing in a standard 14 on the bed-plate of the machine, and the shank of the bent pin is secured within or to the forward end of said shaft in any suitable manner. Upon the forward end of the main shaft or, as herein shown, upon the bent-pin shank, which in effect is a part of the main shaft, is secured an eccentric 15, which is embraced by a fork 16, secured to a crank-frame 17. This crank-frame 17 has the arm 18 extending downwardly from the fork 16, the hollow sleeve or tubular portion 19 having the upwardly-extending arms 20 and 21, through which passes a screw or pin 22, which also engages the arm 18.

The sleeve 19 may be pivoted on the end of a feed rock-shaft, as shown in the Patent No. 568,702, above referred to, or, as herein shown, it may be supported on the screw pin or stud 23, screwed in the standard 14.

Upon the pin 22, between the arms 20 and 21, is pivoted the lug or arm 24, which forms a part of and extends downwardly from the yoke 8, and by means of this pivotal connection between the yoke 8 and the pivoted crank-frame 17 when the latter is oscillated by means of the eccentric 15 and fork 16 a lateral oscillation will be imparted to the yoke 8, thus giving a sidewise movement to the looper-carrier with far less binding and friction than in the patent referred to when there is the direct pivotal connection between the pivoted looper-carrier supporting-yoke and the feed rocking or other supporting shaft.

It will be understood that instead of the means just described a link or toggle connection of any suitable character might be substituted, the object being to provide an intermediate pivotal connection between the oscillatory part to which power is applied by the eccentric on the driving-shaft and the oscillatory part which supports the looper-carrier and gives it its sidewise movement, thereby materially lessening the friction and liability to bind. Furthermore, an advantage arises in this construction, in that the looper-carrier supporting-yoke is pivoted on a part of the driving-pin 10, (the shank,) for by this arrangement the needle-avoiding movement can be made to take place upon the arc of a circle corresponding very closely to that of the periphery of the bed-plate of a cylinder-machine, and, again, whatever the sidewise movement may be the relative center as between yoke, driving-pin, and looper-carrier remains the same, and therefore there can be no jamming or binding between the looper-carrier and the driving-pin.

As a further and special improvement in machines of this character I have provided means whereby in the oscillation of the frame 17 and pivoted yoke 8 perfect freedom of movement may be provided, compensating for the fact that the frame moves in one direction, while the yoke moves in the other. To accomplish this result, the arm or lug 24 is pivoted on the pin 22 by having the elongated vertical slot 25, thus allowing a yielding-motion pivot connection between the yoke and the oscillating frame.

Various modifications and changes in the construction of this apparatus may be made without departing from the spirit of my invention—as, for instance, the frame 17 may have a sliding vibratory movement instead of an oscillating vibratory movement, if desired.

What I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, a looper-carrier, a vibrating frame with means for operating it, and a supporting-yoke on which the looper-carrier is pivoted, said supporting-yoke being pivotally secured to the vibrating frame, and means for oscillating the looper-carrier on its pivotal axis, substantially as described.

2. In a sewing-machine, the combination with an actuating-shaft provided with an eccentric, a pivoted frame, having means for engaging said eccentric, a yoke pivotally attached to said pivoted frame, an inclined crank-pin driven by the actuating-shaft, a looper-carrier pivoted on said yoke, and engaged by the inclined crank, substantially as described.

3. In a sewing-machine in combination with the driving-shaft, a yoke pivotally supported on said driving-shaft, connections between the driving-shaft and the yoke for oscillating the latter, a looper-carrier pivoted on said yoke, and means for oscillating the looper-carrier, substantially as described.

4. In a sewing-machine, in combination with the driving-shaft, having on its forward end an inclined crank, a yoke having a sleeve embracing the shank of said crank whereby said yoke is in effect pivotally supported on the driving-shaft, means for oscillating said yoke, and a looper-carrier pivoted on said yoke and having means for engaging the crank, substantially as described.

5. In a sewing-machine a pivotally-supported frame, means for oscillating it, an oscillating yoke having a sliding pivot connection with said frame, a looper-carrier pivoted on said yoke, and means for oscillating said looper-carrier, substantially as described.

6. In a sewing-machine, a driving-shaft, a pivotally-supported frame, with means for oscillating it, an oscillating yoke pivotally supported on said driving-shaft and having a

sliding pivot connection with said frame, a looper-carrier pivoted on said yoke and means for oscillating said looper-carrier, substantially as described.

7. In a sewing-machine, a swinging yoke, a looper-carrier supported thereon to have movement in the direction of the length of the looper, means for giving it said movement, a driving-shaft, a vibrating frame actuated from the driving-shaft and a free or compensating connection between the frame and the yoke, substantially as described.

8. In a sewing-machine, a looper-operating mechanism which includes a driving-shaft, a yoke pivotally supported thereon and having a downwardly-extending arm and a vibrating frame actuated from the driving-shaft, to which the downwardly-extending arm of the yoke is pivotally connected, substantially as described.

9. In a sewing-machine, a looper-operating mechanism which includes a driving-shaft, a yoke pivotally supported thereon and having a downwardly-extending arm and a vibrating frame actuated from the driving-shaft, with which the downwardly-extending arm has a sliding pivot connection, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LANSING ONDERDONK.

Witnesses:

CHAS. L. STURTEVANT,

F. S. FAWCETT.