(No Model.)

F. T. LEILICH.

CAST-OFF FOR SEWING MACHINE LOOP TAKERS.

No. 418,896. Patented Jan. 7, 1890.

Fig. 1.

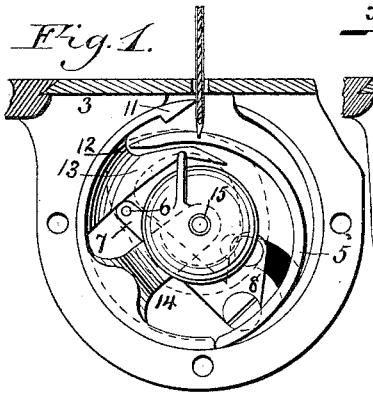


Fig. 2.

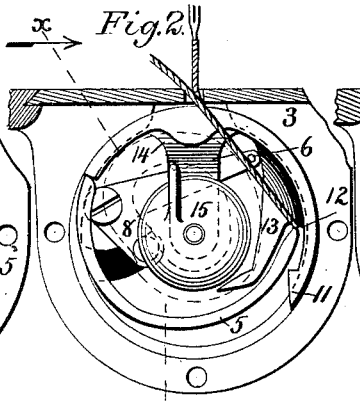


Fig. 3.

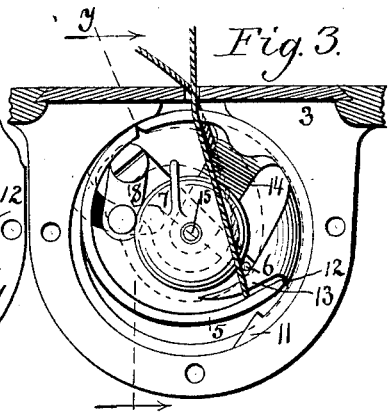


Fig. 4.

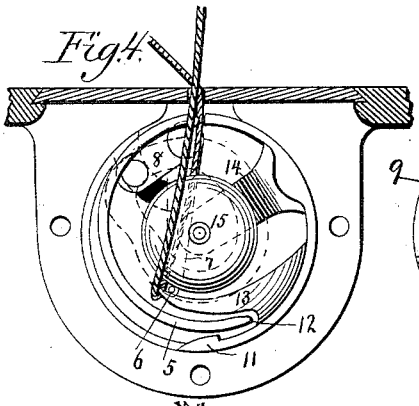


Fig. 6.

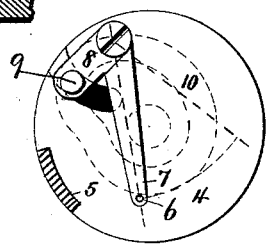


Fig. 5.

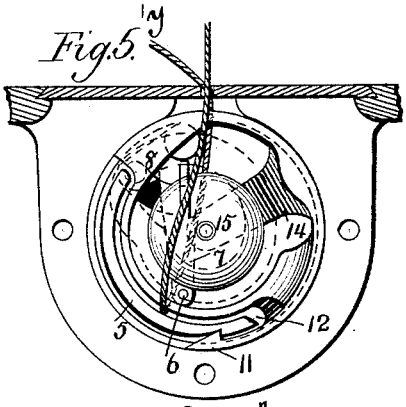


Fig. 7.

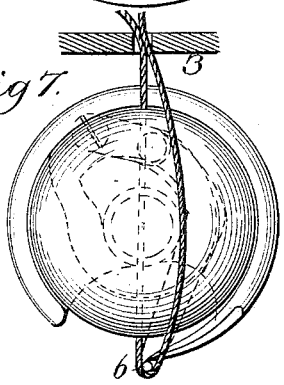


Fig. 8.

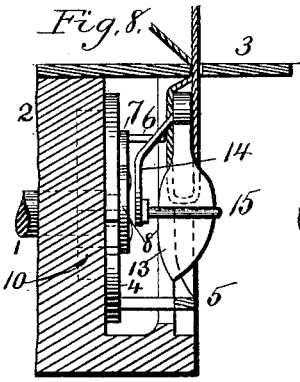


Fig. 9.

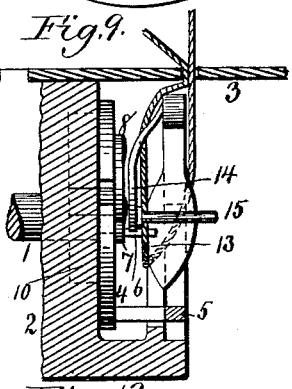


Fig. 10.

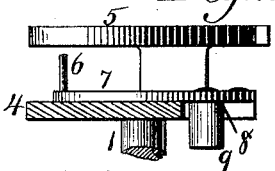


Fig. 11.

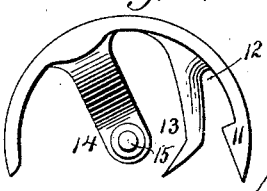
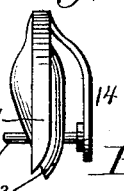


Fig. 12.



Witnesses
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Wm. F. Tanner

Inventor
Francis T. Leilich
by his attorney
D. H. Hubbard

UNITED STATES PATENT OFFICE.

FRANCIS T. LEILICH, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF SAME PLACE.

CAST-OFF FOR SEWING-MACHINE LOOP-TAKERS.

SPECIFICATION forming part of Letters Patent No. 418,896, dated January 7, 1890.

Application filed July 22, 1889. Serial No. 318,244. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS T. LEILICH, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Independent Cast-Offs for Sewing-Machine Loop-Takers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to sewing-machines, and has for its object to improve that class of machines in which the loop-taker travels in a circular path, either by way of oscillation or of complete rotation, so that a superior class of work may be produced at high speed and with a minimum of wear, noise, and friction.

With these ends in view my invention consists in the combination, with the loop-taker and the shaft from which said loop-taker is driven, of means interposed between the loop-taker and its shaft and movable relative thereto, and by means whereof the passage of the loop over the surface of the loop-taker and around the bobbin may be hastened and said loop cast off positively at a point in the revolution of the loop-taker earlier than that at which it could be cast off by the movement of the loop-taker alone.

In order that those skilled in the art to which my invention appertains may fully understand my invention and how to make and use the same, I will now describe it in detail, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a front elevation of an axially-oscillatory loop-taker provided with my improved cast-off, said loop-taker being shown as about to take the loop from the needle; Fig. 2, a similar view showing the positions of the several elements after the loop-taker has advanced, say, ninety degrees, and just before the cast-off has commenced its forward movement; Fig. 3, a similar view showing the positions of the several elements when the cast-off has about half completed its forward movement; Fig. 4, a similar view showing the casting-off operation as about completed; Fig. 5, a similar view, but showing a loop-taker of the rotary-shuttle type, the casting off being just completed; Fig. 6, a front elevation of the driver-shaft disk, showing the cast-off and the method of its arrangement thereon, the outline of the operating-cam and the extent of throw of the cast-off being indicated by dotted lines; Fig. 7, a view similar to the figures preceding, but showing the cast-off as applied to a rotary hook; Fig. 8, a section at the line $x\,x$ of Fig. 2, the bobbin being removed; Fig. 9, a section at the line $y\,y$ of Fig. 3, the bobbin being removed; Fig. 10, a detail section through the driver-shaft disk, the cast-off, its pin, and the shuttle-driver appearing in elevation; Fig. 11, a detail plan view of the oscillatory loop-taker shown at Figs. 1, 2, 3, and 4; Fig. 12, an edge elevation of said loop-taker as shown at Fig. 11.

Like reference-numerals indicate the same parts in all the figures.

1 is the lower shaft of a sewing-machine, which may be driven either variably or isochronously relative to the upper shaft, and which has a bearing in a bracket 2 or other projection below the bed-plate 3 of the machine. Upon its outer end said shaft carries a disk 4, upon which the driver 5 for the loop-taker is mounted.

The cast-off, which while it may be made in other forms, I prefer to construct as a bell-crank lever having a long arm 7 and a short arm 8, and which at its elbow is pivotally attached to the disk 4. The outer end of the long arm bears a pin 6, which projects outwardly therefrom, and the short arm carries upon its under side a stud or roller 9, which, passing through a sectoral slot in the disk, enters a cam-groove 10, cut in the outer face of the shuttle-shaft journal-bracket 2, or in some other stationary part of the machine contiguous to the rear face of the disk 4.

The loop-taker, which, as heretofore stated, may be of any of the several varieties which move in a circular path, is preferably provided with a beak 11 of moderate length, a recess 12 behind the beak, (shown particularly at Fig. 11,) a downwardly-inclined and

forwardly-projecting spreader 13 for opening the loop, and means, as the curved driver 5, for impelling the loop-taker. Said loop-taker has also the inclined bracket 14 extending to the center thereof and bearing the bobbin-pin 15, upon which the bobbin-case holding the bobbin and under thread is set and is free to revolve.

I have thought it unnecessary to show the race-cap, which may be of any ordinary construction, and whereby the loop-taker is held in proper juxtaposition to its driver, and for the same reason the under tension and the bobbin-holder finger have been omitted.

The operation of my invention is as follows: When the needle has descended and has reversed and thrown out a loop of thread, the beak of the loop-taker passes through said loop, while the needle continues its upward movement, the loop-taker meanwhile moving forward through the loop until the latter rests in the recess behind the beak. This is for the purpose of allowing the needle-eye to rise through the goods before the loop is enlarged by the advancing loop-taker, which enlargement necessitates the drawing of thread through the needle-eye during its passage through the goods, and until the loop-taker has advanced to, say, the position shown at Fig. 2 no spreading has occurred, and that portion of thread of the loop which is toward the disk has passed the end of the pin on the long arm of the cast-off. (See Figs. 2 and 8.) Up to this stage of the formation of the stitch the cast-off lever has remained stationary. As soon as the thread has passed the pin, as just described, the loop is quickly spread by the inclined surface of the spreader, so that the thread of the loop which is toward the disk is carried inward beyond the plane of the outer end of the pin on the cast-off. As this occurs, the latter member is moved forward very rapidly by its cam acting through the short arm thereof, and catching up with the thread it pushes the loop forward and over the point of the spreader at a speed much greater than that at which the loop-taker is driven. This action of the cast-off upon the loop is clearly shown in Figs. 3, 4, and 9, and as soon as the loop has been released, it having meanwhile passed around the bobbin, it is drawn up into the goods, forming a completed stitch. After the cast-off the loop-taker, if it be oscillatory, reverses its direction and returns to the position shown at Fig. 1; or if it be continuously rotative it completes its revolution to the position shown at Fig. 1, where the next stitch is commenced. The cast-off meanwhile is returned to its position, as shown at Fig. 1, by the cam. By the use of a separate cast-off the release of the loop, so that the take-up may commence its upward movement, is effected much earlier in the formation of the stitch than it otherwise could be, owing to the position of the loop-taker. (See, for instance, Fig. 4, in which the recess in which the loop would lie, were it not for the independent cast-off, has not nearly arrived at a point where the casting off would naturally occur and the loop be drawn up by the take-up.) The result, is that the time consumed by the loop-taker is relatively shortened and the movement of the take-up may be less abrupt in completing the stitch. Therefore a longer and easier cam may be employed for the operation of said take-up.

It has hitherto been necessary, in order to gain time for the operation of the take-up and feeding devices, to impart to the loop-taker a variably-speeded rotation or oscillation; but I find that by employing the device herein shown and described the variable motion may be nearly or wholly dispensed with, and with an improvement in the quality of the work and with increase of speed and diminution of the wear due to the unequal strain arising from the variable motion. The gain I have secured in the advance of the loop by the cast-off is about fifty degrees of the revolution of the loop-taker.

I desire that it be understood that the gist of my invention rests less in the construction employed than in the method of operation herein set forth, and whose essential principle is embraced in the actuation of the cast-off in the same direction as the loop-taker during the casting-off operation and at a greater speed than said loop-taker, whereby the loop is carried forward upon the latter, and is cast off therefrom earlier than it would otherwise have been.

I claim—

1. In a sewing-machine, the combination, with the loop-taker shaft and the loop-taker, of a cast-off whose operative movement is in the direction of rotation of the hook, means for imparting to this cast-off its forward or operative movement at a speed higher than that of the loop-taker, and further means for returning said cast-off to its starting position.

2. In a sewing-machine, the combination, with the loop-taker shaft and the rotative loop-taker, of a cast-off whose forward or operative movement is in the same direction as and at a higher rate than that of said loop-taker, and a cam for imparting the forward movement to the cast-off.

3. In a sewing-machine, the combination, with the loop-taker shaft, the driver mounted thereon, and the loop-taker driven thereby, of the cast-off whose forward or operative movement is in the same direction as the loop-taker, and a cam engaging the cast-off and adapted to impart thereto its forward movement at a speed higher than the speed of the loop-taker, as specified.

4. The combination, in a sewing-machine, with the loop-taker shaft, the disk on the latter, and the loop-taker, of a cast-off pivoted to the disk and having an outwardly-projecting pin and a cam for actuating the cast-off, whereby said cast-off, after the loop

is taken and moving in the same direction, overtakes and passes the loop-taker and strips the loop therefrom, as specified.

5. In a sewing-machine, the combination, with the loop-taker shaft, the driver, the loop-taker, and a race for the guidance of the latter, of the cast-off lever carried with the loop-taker and having an independent high-speeded movement in the same direction as but independent of said loop-taker, and a cam whereby said movement is imparted to the cast-off lever, substantially as set forth.

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

FRANCIS T. LEILICH.

Witnesses:
S. H. HUBBARD,
H. T. SHELTON, Jr.