

(No Model.)

P. DIEHL.
OSCILLATING HOOK FOR SEWING MACHINES.

No. 523,332.

Patented July 24, 1894.

Fig. 3.

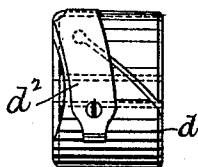


Fig. 2.

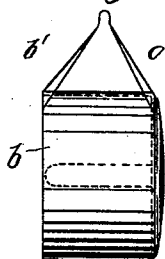


Fig. 1.

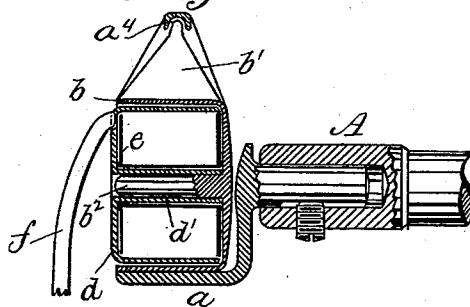


Fig. 6.

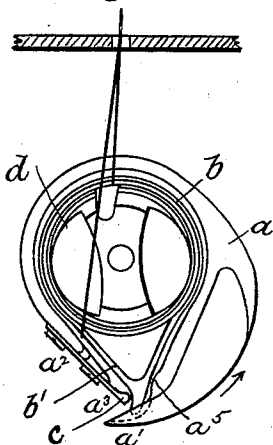


Fig. 7.

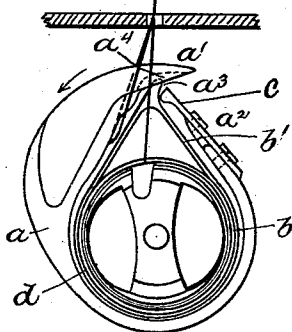


Fig. 5.

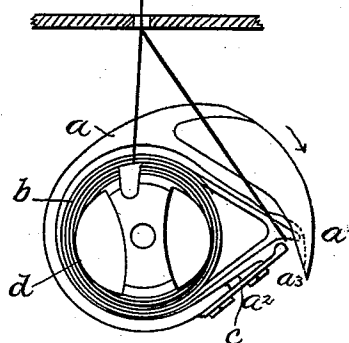


Fig. 4.

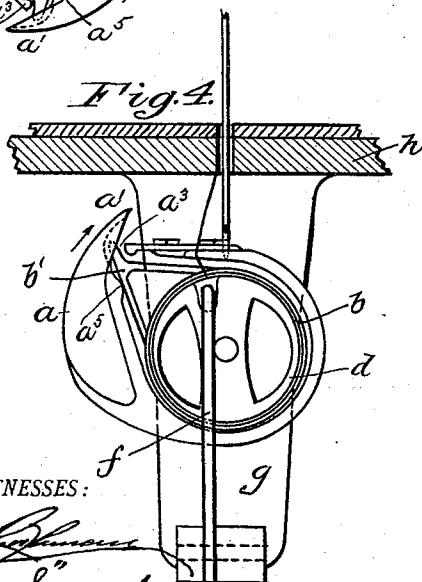
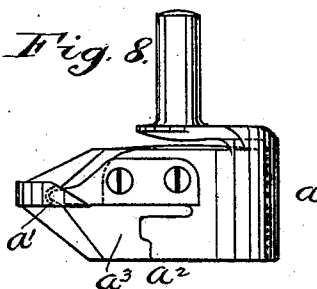


Fig. 8.



WITNESSES:

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ATTORNEYS

UNITED STATES PATENT OFFICE.

PHILIP DIEHL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER
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OSCILLATING HOOK FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 523,332, dated July 24, 1894.

Application filed January 24, 1893. Serial No. 459,615. (No model.)

To all whom it may concern:

Be it known that I, PHILIP DIEHL, 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.

My invention relates to that class of lock-stitch sewing machines in which the lower or locking thread is supplied from a bobbin contained in a bobbin case or holder which is supported in the cavity of an oscillating hook, and which has between its loop seizing beak and its heel a mouth or opening into which the loops of needle thread are entered and out of which they are drawn after they have passed around the locking thread; and my invention has for its object to provide such a construction and arrangement of parts as will avoid peripheral friction between the bobbin case proper (which is to be held stationary) and the moving oscillating hook and which will also permit of an early and easy discharge of the loops of needle thread from the hook.

Another object of my invention is to provide means for positively controlling the loops of needle thread after they have been passed around beneath the bobbin-case so that as they are being drawn up by the take-up they will be held in contact with the beak portion of the hook until they are well shortened as they are being drawn up toward the work-plate, and thus a difficulty sometimes occurring in the class of oscillating hook machines to which my invention relates, and resulting from the kinking of the comparatively long and loosely-held loops of needle thread when the machines are running at high speeds, is avoided.

In my application, Serial No. 455,795, filed December 20, 1892, I have shown and described a cylindrical supplemental bobbin-case resting within the cavity of the said hook and which is provided with a central pin or support engaged by a central sleeve or support on the bobbin case proper, thereby avoiding peripheral contact and friction between the latter, which is held stationary, and the moving oscillating hook. With the employment

of the cylindrical bobbin case shown in my said application the loop-carrying portion of the hook is necessarily extended forward of the point or beak of the hook, and said loop-carrying portion of the hook is thus in the way of so early a discharge of the loops, on the backward movements of the hook, as is desirable.

In this my present invention I avoid the objection mentioned by providing the supplemental or outer bobbin case with a peripheral loop-carrying projection which is preferably of pyramidal form and the point of which is loosely housed within a groove formed in the under or inner side of the loop-seizing beak portion of the hook. This loop-carrying device being thus formed on the outer bobbin case instead of on the hook, as in the other form of my invention, the loops of needle thread will pass around or outside thereof, instead of inside thereof, as before, and I thus provide a construction which enables the said loops to be discharged or drawn up from the hook earlier in the backward movements of the latter than in the former construction, so that more time in the rotation of the needle-bar operating driving shaft is secured for the operation of the take-up and feed, and thus a better timing of the different parts of the machine may be effected.

The pyramidal projection moves with the oscillating hook and is in such position as to extend from the bobbin-case upward toward the work-plate at the time when a loop of needle thread has been carried around below the center of the bobbin-case and is being drawn up by the take-up to tighten the stitch, the said projection (between which and the beak of the hook the loop of needle thread must pass) serving to hold the upwardly moving loop in contact with the beak of the hook until the loop is so short and is so close to the under side of the work-plate that kinking of the thread of the said loop is wholly avoided.

In the accompanying drawings, Figure 1 is a sectional view illustrative of my invention. Figs. 2 and 3 are side views of the supplemental or outer bobbin case and the inner bobbin case, or bobbin-case proper, respectively. Figs. 4, 5, 6, and 7 are front end views

showing the hook, with the bobbin cases contained therein, in different positions, and Fig. 8 is a plan view of the hook.

A denotes a part of the hook shaft which may be oscillated in any suitable manner, as for example, by the mechanism shown by United States Patent No. 388,324, or by that shown by my pending application, Serial No. 448,144, filed October 7, 1892. To the said shaft is attached the hook *a* which is, or may be, substantially the same as that shown by the Vannette patents Nos. 336,456 and 388,323 in that it has a cavity in which is supported the bobbin case inclosing the bobbin carrying the lower or locking thread, said hook having between its loop-seizing point *a'* and its heel *a²* an opening or mouth *a³* into which the loops of needle thread enter, and out of which they are drawn after they have been passed around the said bobbin case and bobbin.

Fitting loosely within the cavity of the hook *a* is the supplemental or outer bobbin case *b* which is provided with a peripheral projection *b'* preferably of pyramidal form, or approximately so, the point of said projection extending into a groove *a⁴* formed in the under or inner side of the loop-seizing beak portion of the said hook, the said point of said projection being preferably inclined forward slightly as shown in the drawings. The said point serves as a stop for the loops of needle thread, and the front side of said projection serves as a loop-carrier to carry the loops of needle thread forward and around the bobbin case, as shown more clearly by Figs. 5 and 6, so that on the backward movement of the hook, when the latter has reached a position a little past that shown by Fig. 7, the loop may be drawn out of the mouth of the hook somewhat earlier in the movement of the latter than is possible with the construction shown by my pending application, Serial No. 455,795, herein before referred to. As the loop of needle thread is being drawn upward, after having been passed around, beneath the bobbin-case *b*, the pyramidal projection *b'* on the said bobbin-case holds said loop in contact with the inner side of the beak of the hook *a*, so that the loop is thus positively held and controlled, until it is so well shortened that said loop cannot twist and kink, the point of the said projection *b'* extending within the groove or recess *a⁴*, formed in the inner or under side of the beak of the hook; assisting in this operation of controlling the thread in that it serves as a slight check on the loop as the latter is drawn upward, said point momentarily holding the loop in contact with the beak of the hook as said loop passes upward; and as the loop will thus be very short when it has finally escaped from the hook all twisting or kinking of the loop, which might otherwise occur at high rates of speed, is entirely avoided.

To retain the outer or supplemental bobbin case within the hook I prefer to attach to the

heel of the latter a holder *c* which extends partly over the mouth *a³* and the end of which is rounded, as shown, and by which and a slight, rounded projection *a⁵* formed on the inner side of the hook the weight of the bobbin cases and bobbin is sustained when the parts assume the positions shown by Fig. 6, so that the point of the projection *b'* on the supplemental or outer bobbin case need never touch the bottom of the groove in the hook in which it is housed.

When the outer bobbin case *b* is to be removed from the hook *a* the holder *c* is taken off, and the point of the projection *b'* may then be turned forward slightly to disengage it from the groove within the side walls of which it is housed, thus leaving the said bobbin case free to be removed from the hook.

The outer bobbin case is provided with a central support or pin *b²* which engages a central support or sleeve *d'* formed on the inner bobbin case or bobbin case proper *d*, the latter inclosing the disk bobbin *e* and being provided with the tension-spring *d²*. The inner bobbin case is held stationary in any suitable manner, as by a latch *f* supported by a hanger *g* depending from the work-plate *h* of the machine. By thus sustaining the stationary inner bobbin case by a central support on the moving outer bobbin case the friction between the parts is reduced to a minimum.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a sewing machine, the combination with a hook having a central cavity and a loop-seizing beak portion provided with a groove or recess on its under side, said groove or recess having opposite walls at the sides of the under portion of said beak, of an outer or supplemental bobbin case having a central support and having also a peripheral projection the point of which is housed within the said opposite side walls of said groove or recess, and an inner bobbin case, or bobbin case proper, having a central support engaging the said central support of the outer bobbin case.

2. In a sewing machine, the combination with a hook having a central cavity, a loop-seizing beak portion provided with a groove or recess on its under or inner side, a heel, and a mouth between said heel and beak, said groove or recess having opposite walls at the sides of the under portion of said beak, of an outer or supplemental bobbin case having a central support and having also a peripheral projection the point of which is housed within the said opposite side walls of said groove or recess, an inner bobbin case, or bobbin case proper, having a central support engaging the said central support of the said outer bobbin case, and a holder for the said outer bobbin case, said holder being carried by said hook and extending partly over said mouth.

3. In a sewing machine, the combination with a hook having a central cavity, a loop-seizing beak portion provided with a groove on

its under or inner side, a heel, and a mouth
between said heel and beak, of an outer or
supplemental bobbin case having a central
support and having also a peripheral projec-
5 tion the point of which is housed within the
side walls of said groove, an inner bobbin
case, or bobbin case proper, having a central
support engaging the central support of the
said outer bobbin case, and a holder for the

said outer bobbin case extending partly over 10
said mouth, said holder being removably se-
cured to the body of said hook.

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

PHILIP DIEHL.

Witnesses:

L. B. MILLER,
FR. MÜLLER.