(No Model.)

G. P. HILL.

COMBINED TENSION AND TAKE-UP DEVICE FOR SEWING MACHINES.

No. 432,617. Patented July 22, 1890.

Fig 1

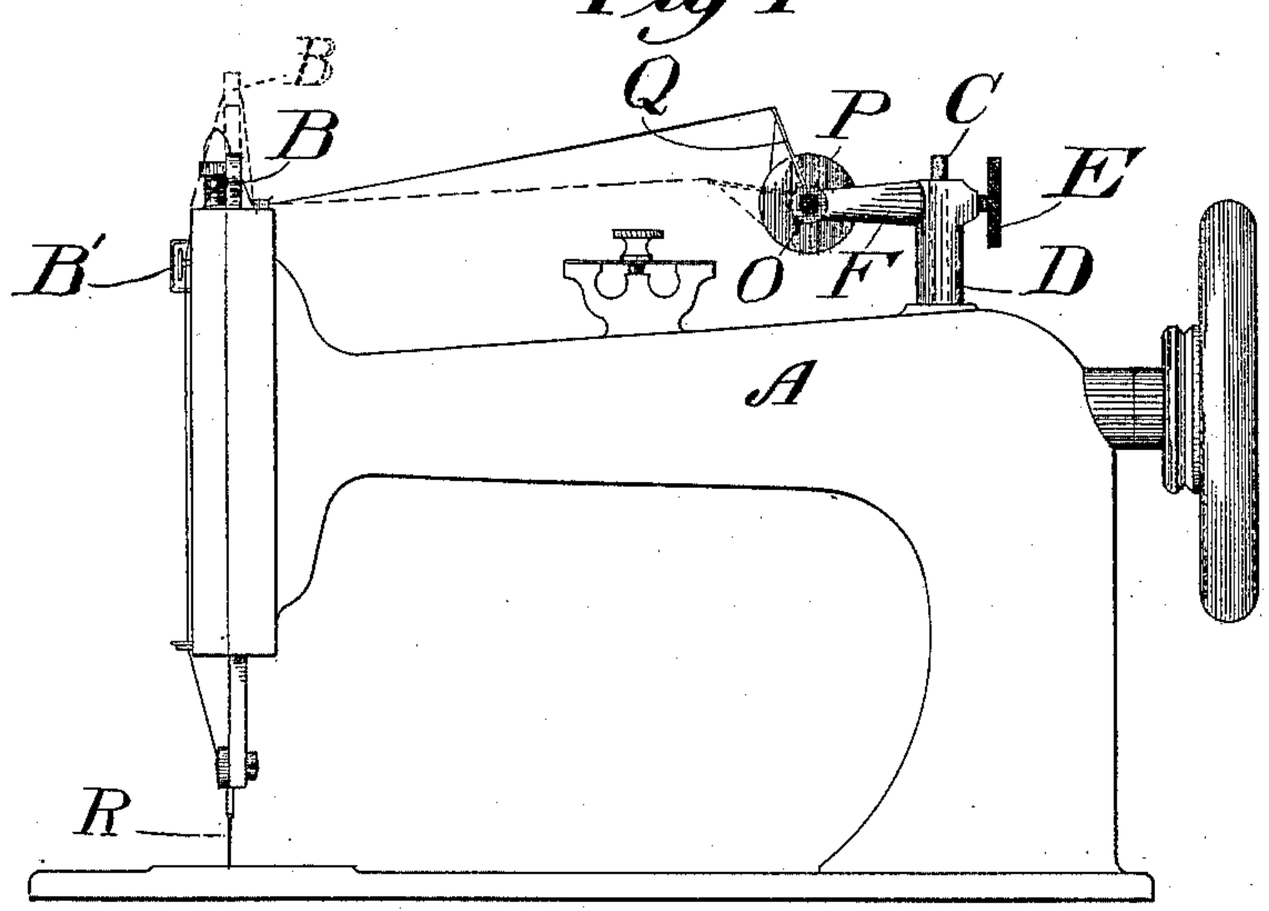
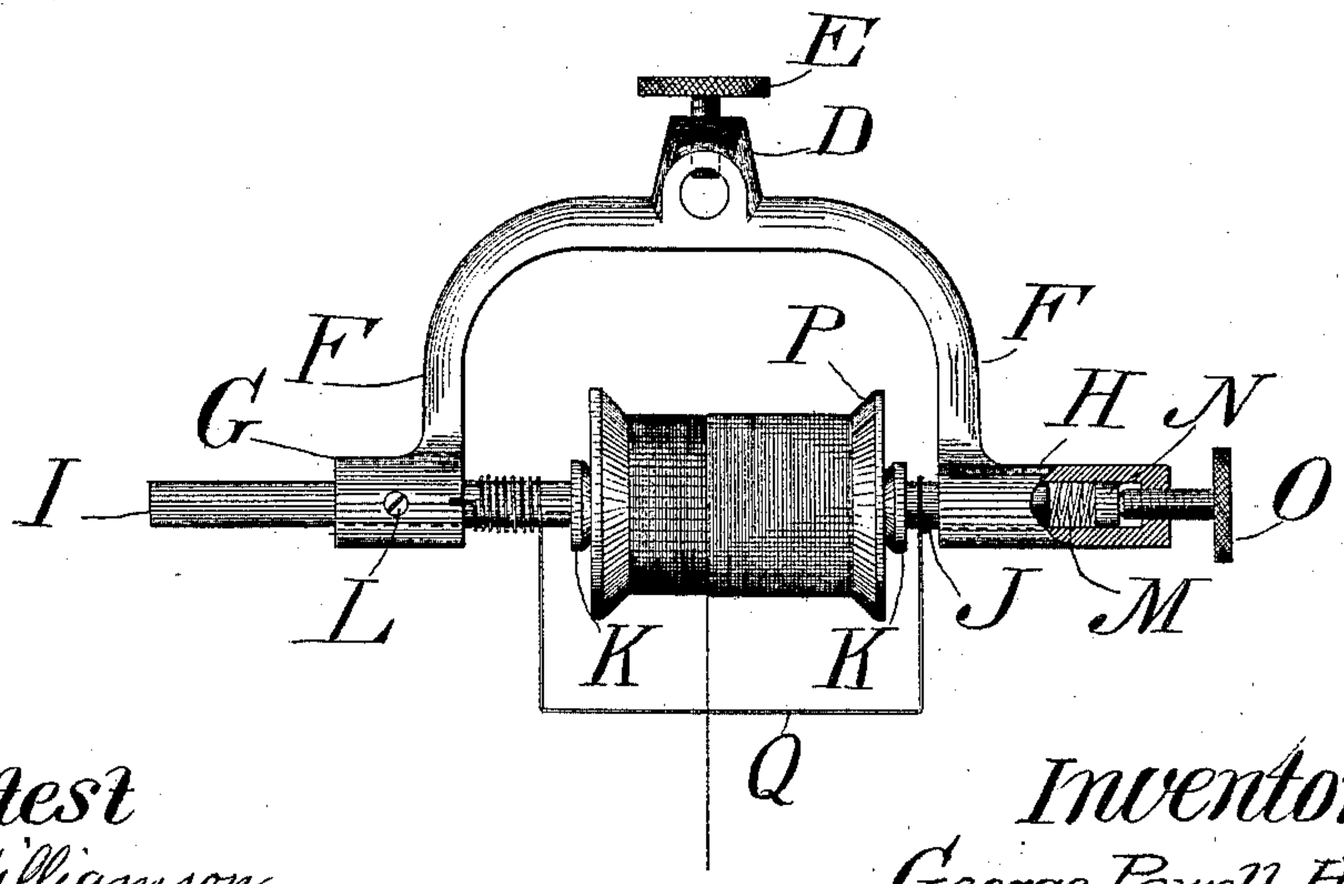


Fig 2



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COMBINED TENSION AND TAKE-UP DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 432,617, dated July 22, 1890.

Application filed November 8, 1888. Serial No. 290,279. (No model.)

To all whom it may concern:

Be it known that I, GEORGE POWELL HILL, a citizen of the United States, residing at Alexandria, in the county of Alexandria and State of Virginia, have invented certain new and useful Improvements in Combined Tension and Take-Up Devices for Use in Connection with Button-Hole-Sewing Attachments for Sewing-Machines; 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.

My invention has reference to certain new and useful improvements in combined tension and take-up devices for use in connection with button-hole-sewing attachments for sewing-machines, and has for its object to preserve intact the normal tension of the sewing-machine and at the same time to take up the slack thread and render the latter perfectly taut during the operation of the primary sewing-machine take-up, whereby the stitches along the edges of the button-hole are purled.

With these ends in view my invention consists in certain details of construction and combination of elements, such as will be hereinafter fully set forth, and then specifically designated by the claim.

In the accompanying drawings, Figure 1 is an elevation of a sewing-machine head provided with my improvement; and Fig. 2, a detail plan of my improvement, partly in section.

Similar letters denote like parts in the several figures.

A is the sewing-machine head, B B′ ordinary primary take-ups, and C the usual spool-spindle.

The best understanding of my invention is had by a knowledge of the sole difficulty which stands in the way of button-hole-sewing attachments, and I will therefore preface the description of my invention by a brief explanation of this difficulty.

In order to obtain good results in sewing button-holes by machine, it is necessary to have a free under tension and a tight upper tension. Now in plain sewing on an ordinary sewing-machine the upper tension has a certain adjustment, and it is of great importance that said adjustment be not altered from time to time, owing to the difficulty of obtaining it.

When an operator has occasion to make use of any attachment on a sewing-machine, the consequent change in the stitch and in the effect to be produced by the operation of the usual take-up mechanism renders it necessary to alter the tension of the upper thread.

In sewing button-holes by means of a machine a purl-stitch not only presents an artistic and attractive effect, but renders the button-hole exceedingly durable, and heretofore this effect has been brought about by giving the upper thread a very tight tension through the ordinary tension device of the sewing-machine, the purling of the stitch being due to the fact that when the take-up draws the upper thread during the ascent of the needle the final movement of said take-up will be resisted by the taut upper thread, the result being that, since the grip of the upper tension offers a greater resistance than that of the lower tension and thread-guiding devices and the fabric combined, the lower thread will be drawn up through the fabric, thus forming the purl-stitch. This purling therefore has been accomplished, as just described, by means of a very tight ordinary sewing-machine upper tension; but, in addition to the before-mentioned disadvantage resulting from this use of said tension, the upper thread is constantly breaking at that point where it passes through the needle-eye, owing to the exceeding tight draft of the thread on the final downward movement of the needle after the bulk of the shuttle has taken up the slack of the loop. My invention overcomes these difficulties, and the following description is now submitted:

D is a bracket adapted to be secured to the spindle C by a set-screw E. The forks F of this bracket terminate in sockets G H, and within these sockets are pins I J, which terminate at their inner ends in cone-bearings K. The pin I is secured in any desired normal adjustment by a set-screw L, while the pin J is backed by a coil-spring M, a follower N, and set-screw O. This spring bears against the rear of the pin J and the inner face of the said follower, while the latter has a free move-

ment within the socket H. The set-screw O extends through the end of said socket and bears directly against the follower, so that it will be readily understood that any outward movement of the pin J will be resisted by said spring.

P is the spool, which is held between the cone-bearings K, as shown at Fig. 1. The unwinding of the thread from this spool is resisted by the frictional clutch of the bearings K against said spool, and said clutch depends upon the resistance offered by the spring M, so that it will be clearly seen that said resistance may be increased or diminished by respectively setting up or backing the screw O.

The spool-holding mechanism above described operates to effect the proper tension upon the upper thread; but I lay no claim to this as a part of my invention, since any tension device separate from the usual sewing-machine tension would serve my purpose equally as well, in view of the fact that the gist of my invention rests in the broad idea of combining with an auxiliary tension my new automatic take-up, which I will now describe.

My improved take-up is supplemental to the sewing-machine take-up, and consists of a spring-actuated lever Q, extended in front of the spool beyond the tension. I have shown this lever in the form of a hoop, one end thereof being attached around the pin J, the other end being coiled around the pin I and secured to the socket G. The object of coiling is to insure a strong spring action to the lever Q, and both ends may be coiled, although I have ascertained by practice that this is not necessary. The thread is led from the spool over the lever Q, and thence to the ordinary primary sewing-machine take-up B B′. When the take-up B ascends to the position indicated by dotted lines in Fig. 1, the thread will be drawn from the spool P, while at the same time the take-up Q will be depressed against its resiliency, as is also shown in dotted lines, the normal position of my take-up Q being in elevation. As the take-up B descends, the upper thread, which would ordinarily become slack, is taken up by the lever Q, which latter is released from its depressed position by the slacking of the thread. When the needle R has reached its lowest point, the thread will be taut between the eye of the needle and the spool, and when the needle has backed to spread the loop for the entrance of the shuttle the bulk of the latter will not effect any undue tension of the thread on the final descent of the needle, since the take-up Q will readily yield to the draft of the thread, thereby supplying enough thread to compensate for that displaced by the shuttle. After the shuttle has passed through the loop the consequent slack of the thread will be immediately taken up by the lever Q as the latter springs back to normal position, thus preserving a taut upper thread as the needle ascends, whereby said thread will be drawn up through the fabric to form a purl-stitch.

As I stated before, I do not wish to be limited to the use of the spool-tension herein shown and described, since any auxiliary tension device may be used in connection with my supplementary take-up, it being essential only that the tension should not be in front of the take-up and that the latter should be spring-actuated, so as to exert a continual pull on the upper thread during the ascent of the needle.

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

In combination, the bracket D, vertically perforated to engage the spool-spindle, the forks F, extending horizontally therefrom and terminating in sockets G H, pins I J, respectively, in said sockets terminating at their inner ends in cone-bearings K to engage a spool, set-screw L, to secure the pin I in its socket, spring M, normally pressing the pin J against the spool, set-screw O, for regulating the pressure of spring M, and spring Q, rigidly secured to pin I, extending around the spool, and having its opposite end engaging around pin J, all as set forth.

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

GEORGE POWELL HILL.

Witnesses:

JOHN F. ELLIOTT,

BENJ. L. FAGIN.