

2 Sheets—Sheet 1.

No. 577,365.

Patented Feb. 16, 1897.



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(No Model.)

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E. C. HOLLAND.
MACHINE FOR SEWING LOOPED FABRICS.

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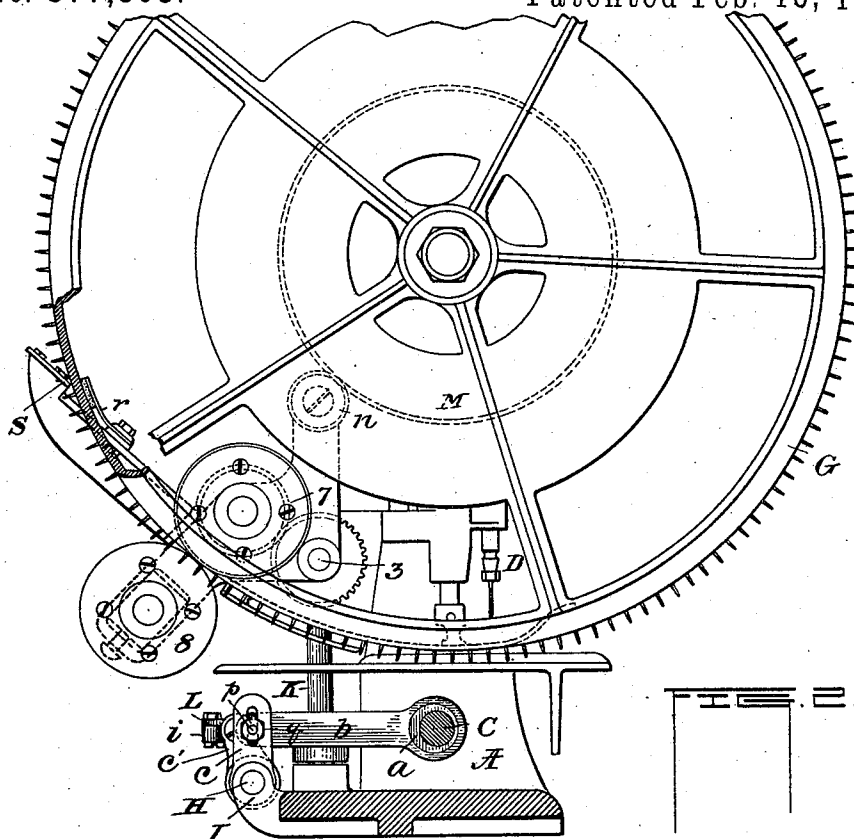


FIG. 1.

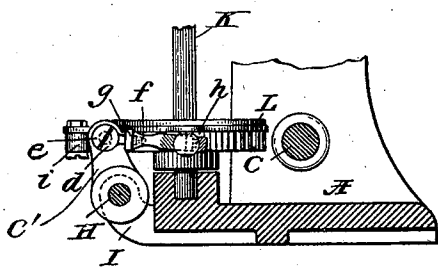


FIG. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR SEWING LOOPED FABRICS.

SPECIFICATION forming part of Letters Patent No. 577,365, dated February 16, 1897.

Application filed July 9, 1892. Serial No. 439,465. (No model.)

To all whom it may concern:

Be it known that I, ELIAS CALVIN HOLLAND, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Sewing Looped Fabrics, 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 that class of machines known as "machines for sewing looped fabrics," used for uniting the edges of knitted fabrics or for sewing together the cuffs and body portions of shirts and drawers.

In Patent No. 469,525, granted February 23, 1892, to Lorenz Muther, there is shown a machine of the general type herein referred to, said machine comprising an overhanging arm, a horizontal continuously-rotatable material-carrying cylinder provided with pins on its periphery, and an intermediate operative mechanism whereby the fabric is fed and the stitches placed therein. It has also been proposed to combine with the construction shown in said patent a trimming device. In both of said constructions above referred to the cylinder is shown in the drawings as having imparted to it a continuous movement in a horizontal plane; but the object of the present invention is to provide a machine of the same general character as above specified in which the cylinder is rotated intermittently and in such a manner as to apply any desired number of stitches to the inch without danger of piling one stitch upon another, breaking of the needles, &c., which have heretofore been objectionable features regarding intermittently-rotated wheels. By the use of an intermittently-rotating wheel upon a machine of the general type mentioned I am enabled to provide an apparatus capable of placing from twenty-two to thirty stitches to the inch, the fabrics being placed over the pins on the material-carrying cylinder without regard to the position of the loops, thereby doing away with the slow process of registry of the loops, which has made the use of so-called "turning-off" machines so expensive in practice.

I am aware that heretofore it has been proposed to use a common sewing mechanism

with an intermittently-rotating pin-wheel and having a trimmer combined with the machine, with mechanism for taking the curl out of the fabric and guiding the same to the sewing and trimming mechanism, as shown in the British patent to Campion and Johnson, No. 2,192 of 1861. The mechanical construction of the machine, however, was defective and would not work at as high a rate of speed as is required at the present day. I have found, however, in practice that with the machine constructed as hereinafter described and claimed results equal to if not in excess of the machines having a continuously-moving cylinder may be accomplished.

While I have herein shown my invention as applied to a machine in which the intermittently-rotating work-carrying pin-wheel is supported upon an overhanging frame or upon the gooseneck of the machine, I desire it to be understood that as to the means for imparting the intermittent movement to the cylinder I do not desire to be limited to any particular construction of machine or arrangement of parts, and, furthermore, while I have shown a trimmer on said machine it will be understood that the same may be dispensed with and the trimming done by hand or by any other independent operation.

The present invention therefore consists in the matters hereinafter described, and referred to in the appended claims.

In the accompanying drawings, which illustrate my invention, Figure 1 is a rear elevation of the machine embodying my invention. Fig. 2 is a bottom plan, partly in section, of the machine. Fig. 3 is a front elevation of the intermittent feed mechanism, the base-plate and frame of the machine not being shown; and Fig. 4 is a horizontal section on the line *iv iv* of Fig. 1.

The sewing-machine forming the basis of my apparatus is substantially the same as that shown in patent to Muther and Dearborn, dated June 3, 1884, and known as the "Union Special." I wish it to be understood, however, that any type of machine may be used, and it is immaterial whether sewing mechanism forming straight or irregular stitches is used.

In the drawings, A represents the frame of

the machine, attached, as shown, to a suitable bracket B on a table in such a way that the needle reciprocates in a horizontal plane.

C is the main shaft of the sewing-machine, and D the needle-bar.

G is the material-carrying cylinder, having on its outer periphery pins or points upon which the goods are impaled and held in proper position to be acted upon by the stitch-forming mechanism. This cylinder is supported in any suitable manner by a vertical overhanging frame or arm E, herein shown as identical with the gooseneck of the sewing-machine. As shown in said patent, the cylinder rotates in a horizontal plane and is provided with a gear M, adapted, by means of a clutch N under the control of the presser-foot, to mesh with a gear-wheel n on the end of a shaft K'. This shaft has on its opposite end a bevel-gear m', meshing with a second bevel-gear m, carried on the outer end of the shaft K. In the former patent referred to this shaft K is actuated by means of a worm-wheel in mesh with a worm on the main shaft of the machine, thereby imparting a continuous movement to the pin-cylinder to feed forward the goods to the stitch-forming mechanism. In the present application I have provided a different means for rotating the cylinder, which will be hereinafter described.

I have shown in the present application a rotary trimmer for cutting off the edge of the fabric after the same has been stitched, but I do not propose to limit myself to any particular construction of trimming attachment. As shown herein, the shaft K is provided with a bevel-gear 1, meshing with a similar wheel 2 on the shaft 3, journaled in suitable bearings 4 on the frame of the machine. This shaft 3 actuates, by means of suitable gearing, (shown in Fig. 1,) the parts 7 8 of the cutting apparatus, the part 8 acting as a bed, upon which the goods rest, the latter being trimmed by the abrading-disk 7.

I do not wish to be limited to any particular manner of connection for actuating the trimmer apparatus, as any suitable means may be used.

A suitable stripper is applied to the machine in rear of the trimmer, as shown at S, for removing the fabric from the cylinder after the trimming is accomplished, and any suitable presser-foot may be employed.

In order to give the cylinder the desired intermittent movement as distinguished from the continuous movements and the impractical intermittent movements referred to, I have devised the following mechanism, which, in combination with the type of machine herein shown, affords a construction capable of performing the desired work. Secured on the main shaft C of the machine is an eccentric a, to which is attached a rod b, secured at its opposite end to an arm c. This arm c is rigidly attached at its inner end to a rock-shaft H, journaled in suitable brackets I on the frame of the machine. At the opposite

end of said rock-shaft H is rigidly secured a second arm c', provided at its outer end with a stud d, upon which is sleeved an arm e, having a screw-threaded shank f, fitting into the shank g of the split bearing h. Having a ball-and-socket connection with said split bearing is a plate L, having an oscillatory movement. This plate L is held in position by means of a ratchet-plate 20 and an annular plate 16. The ratchet-plate 20 is arranged upon the inner face of the plate L and has a hub 15 secured on the shaft K, said hub extending through the plate L, the latter being sleeved thereupon. It will thus be seen that the plate L has movement on an axis concentric with that of the shaft K. A pawl i is pivoted on the plate L and is normally held in mesh with the teeth of the ratchet by a spring k. Upon the face of the plate L, opposite that on which the ratchet is located, an annular plate 16 is provided secured by means of screws 17 18 to the ratchet. The plate L is thus held from displacement by the ratchet and the annular plate, and the rock-shaft H, together with the arms c c', constitute a rocking frame actuated by the main shaft and having connection with the work-carrying cylinder, whereby in the movement of the machine the rocking of the frame gives to the ratchet an intermittent movement, the same being imparted to the cylinder.

As a further and special improvement in the present machine I render the throw of said rocking frame adjustable in order to vary the length of the stitch and thereby the number to the inch. To accomplish this result, I connect the eccentric-rod b to the arm c adjustably, and as a means for making such adjustment I have shown said arm c slotted and the eccentric-rod b connected therewith by means of a stud and nut p q, and it will be readily seen that by adjusting the point of connection of the rod b with the arm c nearer to or farther from the point of oscillation of the arm c—i. e., nearer to or farther from the rock-shaft—the extent of throw of the rocking frame will be varied, and consequently the amount of oscillation of the plate L and the movement of the pawl.

It will be understood that the teeth on the ratchet are very short, corresponding to the greatest number of stitches it is desired to place to the inch, and if a number of stitches less than this is intended to be applied the throw of the frame will be adjusted so that the pawl will catch, say, for example, every other tooth. I preferably connect the trimmer to the shaft K in order that it may be actuated intermittently, and have accordingly claimed such as a part of my invention. In its broad sense, however, I do not desire to be limited in this respect.

In order to prevent any vibratory movement of the pin-cylinder after each movement of the pawl to actuate the same, I have placed upon the machine a brake adapted to bear on the inner periphery of the cylinder to hold

it firmly in the position to which it is advanced. This brake is preferably formed of a strip of spring metal *r*, pivoted at one end to the stripper-bracket and having at its outer end a block of leather or similar material secured upon it and adapted to bear with considerable friction upon the inner periphery of the cylinder. For more firmly crowding the goods on the pins I preferably use the slotted throat-plate shown in the patent referred to, but in addition thereto, if desired, may be provided means for automatically impaling the goods on the cylinder.

It will also be understood that the position of trimmer may be changed from the rear to the front of the needles and that instead of a pawl-and-ratchet mechanism for imparting movement to the shaft K a friction-clutch may be used.

While I have herein shown and described the preferred means for carrying out my invention, it will be understood that I do not desire to be limited to any details of construction, as various ways of accomplishing the desired result may be devised without departing from the spirit of my invention.

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

1. A sewing-machine comprising a main overhanging frame, a rotating material-carrying cylinder journaled to and depending therefrom, a trimming mechanism, a main shaft, and mechanism for intermittently operating the material-carrying cylinder and trimming mechanism comprising a rocking crank-frame, a shaft as K with connections between it and the rocking crank-frame, and independent operative connections between the said shaft K and the cylinder and trimming mechanism; substantially as described.

2. A sewing-machine comprising a main overhanging frame, a rotating material-carrying cylinder journaled to and depending therefrom, a trimming mechanism, a main shaft, and mechanism for intermittently operating the material-carrying cylinder and trimming mechanism comprising a rocking crank-frame, a plate arranged to oscillate on a horizontal axis in operative connection with said rocking crank-frame, and operative connections between the plate and the cylinder and trimming mechanism; substantially as described.

3. The combination with a rotating material-carrying cylinder, of a main shaft, a rocking crank-frame with operating connections between it and the main shaft and intermittently-operated connections between the rocking frame and the material-carrying cylinder comprising an oscillating plate carrying a spring-pawl; substantially as described.

4. The combination with the rotating material-carrying cylinder of the main shaft, a rocking shaft parallel therewith, connections between the two for oscillating the latter, a crank on one end of said rock-shaft, an oscillating plate as L, a spring-pawl carried thereby, a ratchet-wheel driven by said pawl, operative connections between the pawl-and-ratchet mechanism and the material-carrying cylinder, and connections between the crank and the plate L for oscillating the latter; substantially as described.

5. The combination with the rotating material-carrying cylinder, of the main shaft, a rock-shaft parallel therewith, connections between the two for oscillating the latter, a crank on one end of said rock-shaft, an intermittently-operated driving connection intermediate the cylinder and said crank and comprising an oscillating plate carrying a spring-pawl, and a ratchet-wheel driven thereby, with a universal-joint connection between said crank and the intermittently-operated driving connection; substantially as described.

6. The combination with the rotating material-carrying cylinder, of the main shaft, the rock-shaft, the crank *c'* on said rock-shaft having a stud *d*, the arm *e* sleeved thereon and having a screw-threaded shank *f*, the split bearing *h* having the shank *g* into which *f* extends and the oscillating plate L having a ball-and-socket connection with the split bearing, and connections between the oscillating plate and the material-carrying cylinder; substantially as described.

7. The combination with the horizontally-rotating material-carrying cylinder, of the main vertical shaft, a rock-shaft parallel therewith, connections between the two for oscillating the latter, a crank on one end of said rock-shaft, an oscillating plate as L, a pawl-and-ratchet mechanism driven by said plate, operative connections between the pawl-and-ratchet mechanism and the material-carrying cylinder, including a horizontally-arranged shaft, and connections between the crank and the plate L for oscillating the latter; substantially as described.

8. The combination with the main shaft, stitch-forming mechanism, trimmer and horizontal work-carrying cylinder, of a rocking frame driven by the main shaft, an oscillating plate driven by said rocking frame, a pawl on said plate, a shaft as K, a ratchet on said shaft engaged by said pawl, and driving connections between the shaft K and the cylinder, and means for operating the trimmer; substantially as described.

9. The combination with the main shaft, stitch-forming mechanism, trimmer, and horizontal work-carrying cylinder, of an eccentric on the main shaft, a rod *b* attached thereto, a rock-shaft H, arm *c* rigidly secured thereto and having adjustably pivoted to it the rod *b*, arm *c'* on the opposite end of the shaft, rod or arm *e*, pivoted thereto, ball-and-socket bearing *h*, oscillating plate L, pawl carried by said plate, shaft K, ratchet on the end of the shaft engaged by the pawl and connections between the shaft and the cylinder and means for operating the trimmer; substantially as described.

10. The herein-described pawl-and-ratchet mechanism comprising a shaft as K, the oscillating plate L, the ratchet-plate 20 arranged adjacent one side of the plate L, secured to the shaft, and having a hub on which the plate L is sleeved, a plate 16 arranged adjacent the opposite side of the plate L and rigidly secured to the plate 20, and a pawl carried by the plate L and normally engaging the teeth of the ratchet-plate 20; substantially as described.

11. In combination with the rotating material-carrying cylinder, a stitch-forming mechanism with means for operating the same, a trimmer, a stripper arranged in rear of the trimmer for removing the fabric from the cylinder, and a brake bearing on the inner periphery of the cylinder; substantially as described.

12. In combination with the stitch-forming mechanism, the cylinder and means for operating the latter intermittently, a stripper for removing the goods from the cylinder, a brake pivoted to the stripper and composed of a strip of spring metal, having at its outer end a block of leather or other frictional material bearing on the inner periphery of the cylinder; substantially as described.

13. In combination with the main vertical shaft, the vertical rock-shaft with connections between the two, the overhanging arm, the horizontal rotatable material-carrying cylinder supported by said overhanging arm, suitable stitch-forming mechanism, a trimmer, a horizontal shaft K, operative connections between said shaft K and the cylinder and trimmer and a vertically-arranged pawl-and-ratchet mechanism secured to the shaft K and in operative connection with the vertical rock-shaft; substantially as described.

14. In the herein-described machine for sewing looped fabrics, the vertically-arranged pawl-and-ratchet mechanism comprising the oscillating plate L having the downwardly-extending shank portion, a rock-shaft to which the same is universally jointed with connections between said rock-shaft and the main shaft of the machine, a pivoted spring-pressed pawl attached to said plate L, a ratchet-plate with the teeth of which the pawl normally engages, said ratchet-plate being

secured on the shaft K, but the plate L being sleeved on the hub of said ratchet-plate; substantially as described.

15. In combination with the main shaft having an eccentric thereon, a vertical rock-shaft journaled in bearings I, a horizontally-extending slotted crank-arm fixed on said rock-shaft, a connecting-rod secured at one end to the eccentric on the main shaft and at the other end adjustable in the slot in said crank, a second crank on the upper end of said rock-shaft II, suitable feeding and trimming mechanisms with connections between said crank on the upper end of the shaft II and said feeding and trimming mechanisms for operating the latter; substantially as described.

16. A machine for sewing looped fabrics comprising a vertical, overhanging frame, a horizontal rotatable material-carrying cylinder provided with impaling-points journaled to and rotating beneath said overhanging frame, a vertically-arranged driving-shaft, a rocking crank-frame supported on a vertical axis parallel with the axis of the driving-shaft, a vertically-arranged pawl-and-ratchet mechanism oscillating on an axis at right angles to the axis of the driving-shaft, connections between said pawl-and-ratchet mechanism and the rocking crank-frame, a horizontally-arranged rotary cutting apparatus and connections between said vertical pawl-and-ratchet mechanism and the cutting apparatus and between the pawl-and-ratchet mechanism and the material-carrying cylinder, and suitable stitch-forming mechanism; substantially as described.

17. In combination with the driving-shaft arranged to rotate on a vertical axis, the single eccentric thereon, the horizontally-rotatable material-carrying cylinder and trimmer, the rocking vertical crank-frame connected with the single eccentric, and connections between the rocking crank-frame and the cylinder and trimmer; substantially as described.

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

ELIAS CALVIN HOLLAND.

Witnesses:

CHESTER MCNEIL,
W. L. SWIFT.