No. 783,694. PATENTED FEB. 28, 1905.

F. J. HUDSON.

RUFFLING SEWING MACHINE.

APPLICATION FILED SEPT. 24, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

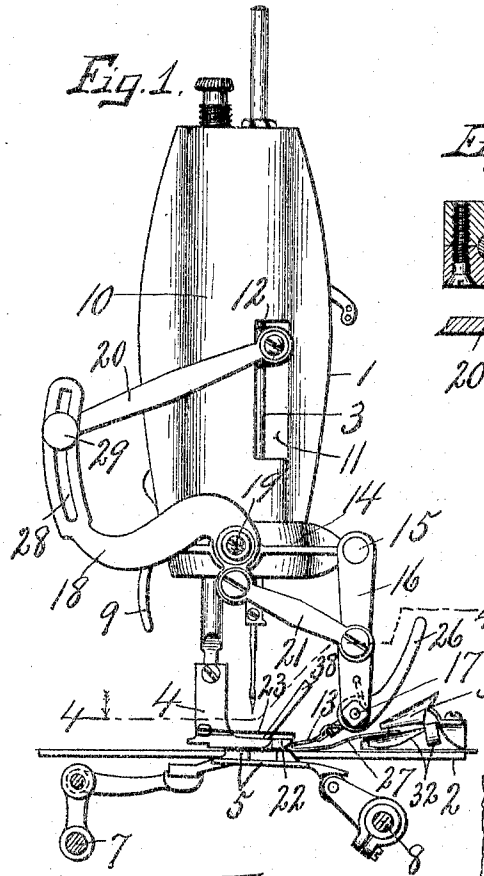


Fig. 5.

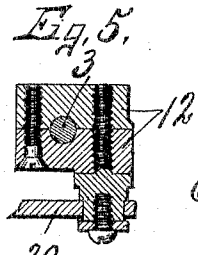


Fig. 2.

Fig. 3.

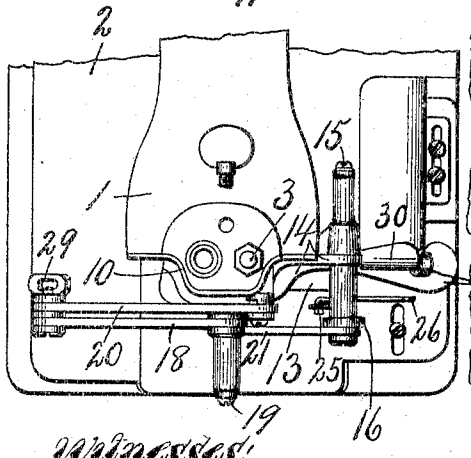
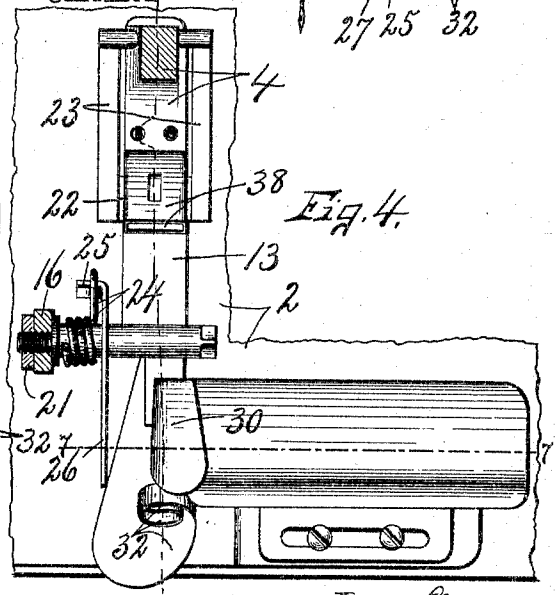


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 6.

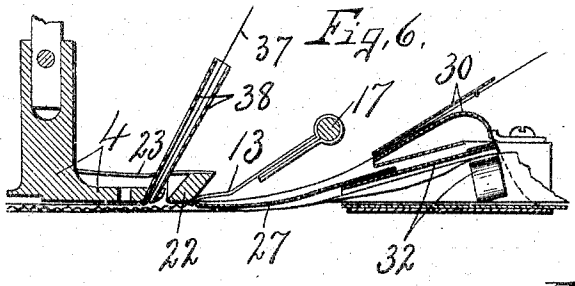


Fig. 7.

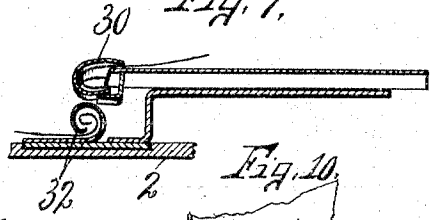


Fig. 10.

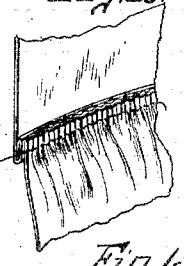


Fig. 8.

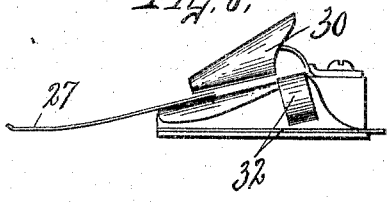


Fig. 9.

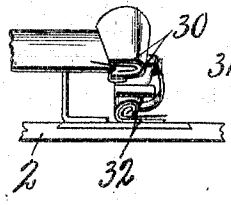


Fig. 13.

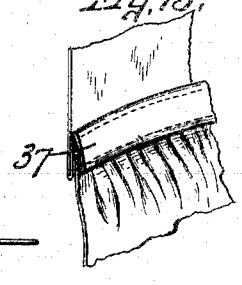


Fig. 11.

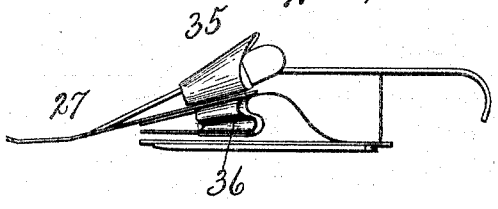
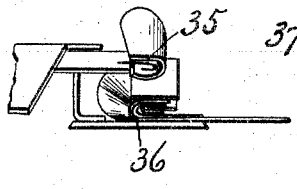


Fig. 12.



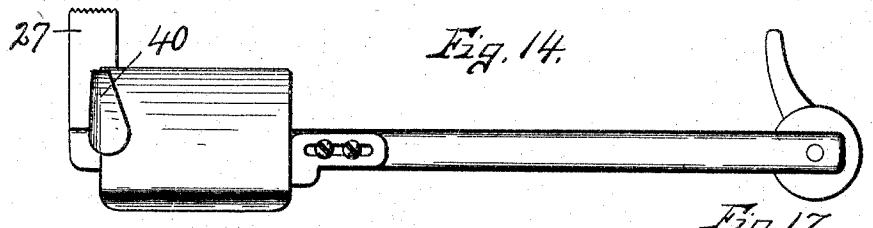


Fig. 14.

Fig. 15.

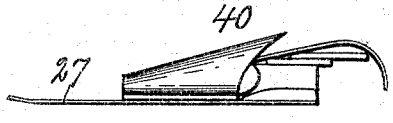


Fig. 16.

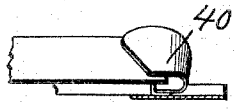
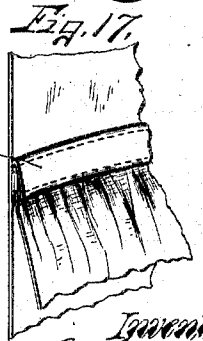


Fig. 17.



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No. 783,694. Patented February 28, 1905.

UNITED STATES PATENT OFFICE.

FRANK J. HUDSON, OF WEEDSPORT, NEW YORK, ASSIGNOR OF ONE-HALF TO CARL L. BENNETT, OF WEEDSPORT, NEW YORK.

RUFFLING SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 783,694, dated February 28, 1905.

Application filed September 24, 1903. Serial No. 174,402.

To all whom it may concern:

Be it known that I, FRANK J. HUDSON, of Weedsport, in the county of Cayuga, in the State of New York, have invented new and useful Improvements in Ruffling Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in ruffling sewing-machines.

The object is to provide a simple and efficient ruffling device which is operatively connected to and actuated by the needle-bar of the machine, whereby a ruffle may be formed and simultaneously stitched to the body of a garment and a facing or cover stitched over the head of the ruffle, all in the same operation.

Another object is to permit the use of various turning and hemming devices in connection with the ruffler, so that the ruffle may be joined to the edge of the garment or anywhere around the body of a skirt or other garment with or without the facing-strip, the turning, hemming, ruffling, and facing being performed in a single operation.

In the drawings, Figures 1 and 2 are face views of a portion of a sewing-machine and my improved attachment operatively mounted thereon, the shirring-pawl and its operating mechanism being shown in different positions and the face-plate seen in Fig. 1 being removed in Fig. 2 to disclose the interior mechanism. Fig. 3 is a top plan of the mechanism seen in Fig. 1. Figs. 4, 5, and 6 are sectional views taken, respectively, on lines 4 4, Fig. 1, 5 5, Fig. 2, and 6 6, Fig. 4. Fig. 7 is a sectional view taken on line 7 7, Fig. 4. Figs. 8 and 9 are detail views, in side and end elevation, of the detached hemmer and turner seen in Figs. 1 to 7, inclusive. Fig. 10 is a perspective view of a portion of a skirt with the ruffle attached to its edge and showing the hem of the garment and overturned edge of the ruffle as produced by the devices seen in Figs. 8 and 9. Figs. 11 and 12 are side and end views of a modified former for turning the edges of the garment and ruffle. Fig. 13 shows a ruffle attached to the edge of the garment with a facing-strip stitched over the joined edges, the overturned edges of the garment and ruffle being produced by the devices seen in Figs. 11 and 12. Figs. 14, 15, and 16 are respectively top plan, side elevation, and end view of a further modified former. Fig. 17 is a perspective view of a portion of the garment, showing a ruffle and facing-strip stitched thereto, the devices seen in Figs. 14, 15, and 16 showing the means of overturning the edge of the ruffle.

Similar reference characters indicate corresponding parts in all the views.

In order to demonstrate the practicability of my invention, I have shown portions of an ordinary Singer sewing-machine, consisting of a head 1, a base-plate 2, a vertically-movable needle-bar 3, a presser-foot 4, and a fabric-feed 5, all of which parts are well-known and the moving parts are operated in the usual manner—that is, the needle-bar is operatively connected to and actuated by a rotary shaft 6, and the feeding device 5 is operatively connected to and actuated by suitable rock-shafts 7 and 8, while the presser-foot 4 may be raised and lowered by means of a lever 9.

The parts thus far described are of the ordinary construction found in the larger sewing-machines, and it is therefore thought to be unnecessary to enter into a detail description of the structure and mode of operation.

The mechanism inclosed within the head 1 is shielded or concealed by a face-plate 10, and in order to apply my invention to the machine this face-plate is provided with a vertical slot or opening 11 to receive a projecting portion of a head 12, which is secured directly to the needle-bar 3 and moves vertically therewith. A ruffling device, as a ruffling-blade 13, is operatively connected to and actuated by the reciprocating head 12, so that as the needle-bar is reciprocated in the act of stitching the ruffling-blade 13 is moved horizontally back and forth toward and from the needles for the purpose of forming the ruffle and feeding the same to the needle or needles, as it is evident that one or more needles may be employed. Any suitable mechanism for transmitting motion from the needle-bar to the ruffling-blade 13 may be employed; but in the present instance I have shown the

head 1 as provided with a bracket 14, to the front end of which is pivoted at 15 the upper end of a rock-arm 16, and the ruffling-blade 13 is pivotally mounted upon a stud 17, which projects laterally from and is secured to the lower end of the arm 16. A lever 18 of the first kind is pivoted at 19 to the bracket 14, and one arm of this lever is connected by a link 20 to the head 12 on the needle-bar 3 while the other arm, which is the shorter, is connected by a link 21 to the intermediate portion of the rock-arm 16, so that when the needle-bar is elevated the ruffling-blade 13 is forced forwardly or toward the needle for feeding the ruffle beneath the latter, and when the needle-bar is depressed the ruffling-blade is drawn backwardly to obtain a fresh grip upon the fabric of the ruffle.

In the operation of a sewing-machine of this character the feeding device 5 is arranged and operated to feed the fabric rearwardly while the needles are descending from their extreme upper position, while the mechanism which operates the ruffling-blade 13 is arranged to feed the ruffle forwardly as the needles are being moved upwardly from their extreme lower position. It is therefore apparent that when the ruffling-blade 13 is moved toward the needle the fabric which is engaged thereby is fed toward the needle and gathered between the feeding edge of the ruffling-blade and needle to form the ruffle. The movement of the ruffling-blade is sufficient to force the gathered portion of the fabric onto the feeding device 5, by which the fabric is carried forward beneath the presser-foot when the ruffling-blade recedes and the needle is elevated out of the fabric. In order that the portion of the ruffle which is thus gathered may be held and pressed upon the feeding device 5, I provide the presser-foot 4 with a yielding toe 22, which is mounted upon one end of a spring 23, the other end being secured to said presser-foot, and it therefore follows that when the ruffling-blade 13 is moved toward the needles its front end not only feeds the fabric of the ruffle forwardly beneath the presser-toe 22, but also slightly engages and elevates said toe 22 against the action of the spring 23 to relieve the pressure on the ruffle and permit it to be fed under the presser-foot with greater ease and certainty; but immediately upon the recession of the pawl the presser-bar 22 operates to press the ruffle against the feeding device 5 preparatory to its entrance under the presser-foot 4. This ruffling-blade 13 preferably consists of a thin spring-plate having its feeding edge toothed or serrated to more positively engage and feed the fabric, and while it is pivotally mounted upon the stud 17 it is normally held down by an additional spring 24, which is coiled around the stud 17 and has one end engaged with the rock-arm 16 and its other end bearing upon a shoulder 25 of the ruffling-blade 13, a suitable handpiece 26 being also secured to the ruffling-blade, whereby the latter may be raised against the action of the spring 24 when desired, and particularly when the fabric which forms the ruffle is first fed into the machine by hand.

It has been previously stated that this device is for the purpose of forming and attaching the ruffles to skirts and other garments, and this implies that two pieces of fabric are fed through the machine simultaneously, one being the body or skirt of the garment and the other the fabric which forms the ruffle, and in order to permit the body of the fabric, as the skirt, to be fed smoothly through the machine without kinking and to prevent any retrograde or backward movement of the ruffle when its ruffling-blade is being drawn backward I provide a spring-holding pawl or detent 27, which is secured in any desired manner to the bed-plate 2, and its forward edge is usually turned up and slightly serrated to better engage and hold the fabric. The ruffling-blade 13 normally bears upon the holding-pawl when in its extreme backward position and rides forwardly beyond the serrated edge of the holding-pawl, and the pressure of this ruffling-blade 13 is sufficient to force the holding-pawl into contact with the upper face of the bed 2; but this holding-pawl is tensioned to spring upwardly away from the bed-plate when the ruffling-blade 13 is elevated. The body of the skirt or garment to which the ruffle is to be applied is fed beneath the holding-pawl 27, while the fabric which forms the ruffle is fed between said pawls, so that the detent not only serves to straighten or smooth the main body while being fed beneath the needles, but also prevents backward movement of the fold or gathering in the ruffle when the ruffling-blade 13 is drawn backwardly. In forming these ruffles it is necessary to increase or diminish the fold or gather of the ruffle, as may be desired, and this is accomplished by regulating the amount of movement of the ruffling-blade 13, which is done by making the connection between the lever 18 and link 20 adjustable, as seen in Figs. 1 and 2, in which the lever is shown as provided with a lengthwise slot 28 for receiving a clamping screw or head 29 on the lever 20, whereby the rocking movement of the lever, and therefore the amount of movement of the ruffling-blade 13, may be varied at will. It is also necessay in forming and applying these ruffles to turn the edge of the ruffle inwardly as it is applied to the body of the skirt or other garment, and I have therefore shown a suitable guide or edge-turning attachment 30, which is secured to the bed-plate at a suitable distance from the presser-foot, said turning attachment being better seen in Figs. 6 and 7. These ruffles are sometimes joined to the edge of the garment, which is usually called "head-

ing" and "ruffling," in which instance the edge of the main body is turned into what is known as a "hem" 31, as seen in Fig. 10, and when this is desired I apply a guide or hemming attachment 32, which is used in connection with the turning attachment 30, so that the hemming of the garment and turning of the ruffle are formed while the ruffle is being formed and stitched to the garment, these hemming and ruffling devices being clearly seen in Figs. 1 to 10, inclusive. In other instances it is necessary to join the ruffle to the edge of the fabric and to apply a suitable facing to cover the junction of the two pieces, and in this case I apply two turning devices 35 and 36, Figs. 11 and 12, one for turning the edge of the garment and the other for turning the edge of the ruffle, and the facing, as 37, which is previously prepared, is fed through a guide 38, rising from the presser-foot 4.

In applying the ruffle to the main body of the skirt or other garment, as seen in Fig. 17, a simple turning attachment 40, Figs. 15 and 16, is employed to turn the edge of the ruffle, and in this instance a suitable facing 37 may be applied and stitched to the ruffle and body of the garment at their junction, as seen in Fig. 17.

Although I have shown and described several methods of turning the edges of the garment and ruffle preparatory to stitching the same together, it is evident that other attachments may be employed in connection with the main feature of my invention—viz., the operation of the ruffling-pawl 13 by means of the needle-bar 3.

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

1. In a machine for forming and stitching ruffles to garments, the combination of a bed-plate, a needle-bar and a presser-foot having a yielding toe, means to feed the garment under the presser-foot, a spring-detent above the bed-plate and forming a support for the ruffle-strip, and a pivoted ruffling-blade operatively connected to and actuated by the needle-bar to feed and ruffle the strip under the yielding toe and to the garment-feeding device, said ruffling-blade having a handpiece whereby it may be rocked on its pivot.

2. In a machine for forming and stitching ruffles to garments, the combination of a bed-plate, a needle-bar and a presser-foot having a yielding toe, means to feed the garment under the presser-foot, a spring-detent above the bed-plate and forming a support for the ruffle-strip, and a ruffling-blade operatively connected to and actuated by the needle-bar to feed and ruffle the strip under the yielding toe and to the garment-feeding device, and a facing-strip guide above the ruffle-strip-feeding blade and terminating near the front end of the presser-foot and at the rear of its yielding toe.

3. In a machine for forming and stitching ruffles to garments, the combination of a bed-plate, a needle-bar and a presser-foot having a yielding toe, means to feed the garment under the presser-foot, a fixed spring-detent above the bed-plate and forming a support for the ruffle-strip, a ruffling-blade spring-pressed toward and movable along the top face of the detent to feed and ruffle the strip under the presser-foot, means actuated by the needle-bar and connected to operate the ruffling-blade, and a turning device at the rear end of the detent for turning over the edge of the ruffling-strip as it is fed along the detent.

4. In a ruffling sewing-machine, the combination of a bed-plate, a needle-bar and a presser-foot having a yielding toe, of a fixed spring-detent above the bed-plate and forming a support for the ruffling-strip, a ruffling-blade spring-pressed toward and movable along the detent and operating to feed and ruffle the strip under the toe, connections between the needle-bar and ruffling-blade for operating the latter, and a facing-strip guide terminating at the rear in front of the yielding toe to guide a facing-strip beneath the presser-foot.

5. In a ruffling sewing-machine, the combination with a fixed support and a reciprocating needle-bar, of a lever of the first kind fulcrumed on the support, a link having one end attached to and moving with the needle-bar and its other end adjustably connected to one arm of the lever to rock said lever, a rock-arm having a fixed fulcrum, a second link connected to transmit motion from the lever to the rock-arm, and a ruffling-blade pivoted to the free end of the rock-arm.

6. In a ruffling sewing-machine, the combination with a bed-plate, needle-bar and feeding device, of a presser-foot having a yielding toe, an edge-turning device adjustably secured to the bed-plate for turning the edge of the ruffle while being stitched to the garment, a holding-pawl projecting from said edge-turning device under the yielding toe for supporting and preventing backward movement of the ruffle-strip, and a ruffling-blade riding on the holding-pawl and operatively connected to and actuated by the needle-bar.

In witness whereof I have hereunto set my hand this 19th day of September, 1903.

FRANK J. HUDSON.

Witnesses:
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HOWARD P. DENISON.