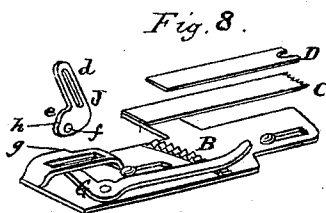
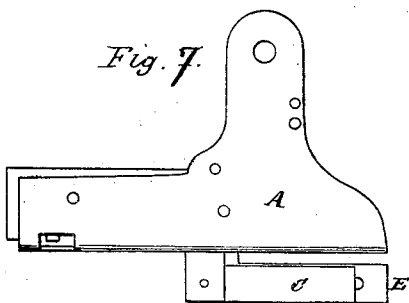
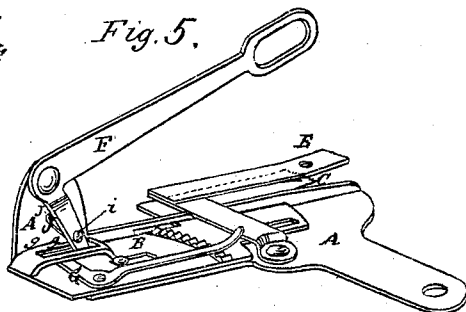
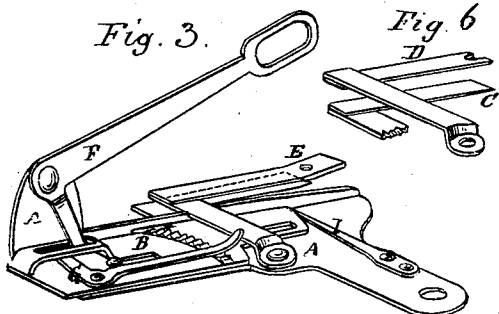
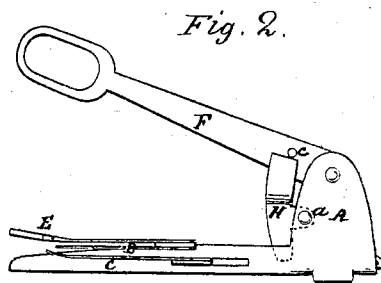
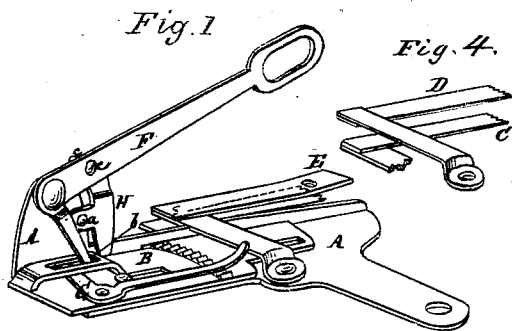


A. JOHNSTON.
Gathering or Ruffing-Attachments for Sewing-
Machines.

No. 135,122.

Patented Jan. 21, 1873.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALLEN JOHNSTON, OF OTTUMWA, IOWA.

IMPROVEMENT IN GATHERING OR RUFFLING ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **135,122**, dated January 21, 1873.

To all whom it may concern:

Be it known that I, ALLEN JOHNSTON, of Ottumwa, Wapello county, Iowa, have invented certain new and useful Improvements in Gathering and Ruffling Attachments for Sewing-Machines, of which the following is a specification:

This invention relates to that class of gathering and ruffling attachments in which the gather is formed by means of a reciprocating knife or blade operated from the needle arm or bar, as shown, for instance, in Letters Patent granted to me, and to William T. Johnston and myself, and recently reissued to the Johnston Ruffler Company, numbered 5,070, 5,071, 5,072.

In gathering attachments of this kind the blade, when it pushes forward the work to make the gather, is required to push the gather far enough to cause the latter to be in the path of or even a little beyond the needle when it descends. The front end of the blade must therefore advance beyond and over the needle-hole in the cloth-plate of the machine, and, owing to the arrangement of the angle-lever or device which communicates motion to the blade from the needle bar or arm, the backward movement of the blade in order to take a fresh hold on the goods does not commence until the needle-bar has descended far enough to cause the needle to approach very near to, if not to enter, the needle-hole in the cloth-plate. To prevent, therefore, the blade from interfering with the needle, it has hitherto been considered indispensable to form a slot in the front end of the blade, through which the needle can pass. It has been my object to do away with the necessity for this slot, so that in the attachment an unslotted blade may be used where otherwise a slotted blade only would be of service. To this end I cause the gathering-blade to recede at about the instant the needle commences its descent, and so that before the needle descends far enough to endanger its striking upon or interfering with the gathering-blade the latter will have been retracted entirely out of the path of the needle; and it is in this feature principally that my invention is comprised. With a gathering-blade thus operated the upper stationary holding-blade described in reissue 5,072, above mentioned, is of special value, for

the gathering-blade can draw back from the newly-formed gather immediately upon the commencement of the descent of the needle, and before the latter pierces the goods, without danger of disturbing in any way the gather, which will be held in place by the stationary blade until sewed down by the needle.

The manner in which my invention is or may be carried into effect will be understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of an attachment made in accordance with my invention. Fig. 2 is a front elevation of the same. Fig. 4 is a view of the gathering and holding blades detached. Figs. 3 and 5 are attachments containing modified forms of the invention. Fig. 6 is a detached view of the blades of the attachment, Fig. 3. Fig. 7 is an under-side view of the same attachment. Fig. 8 is a perspective view of the gathering plate and blade and the holding-blade detached from the attachment shown in Fig. 5, together with the cam for starting the back motion of the gathering-blade, as hereinafter described.

I wish it to be understood that this invention may be applied to any gathering attachment operating upon the principle above described, and whether the attachment is to be secured to the cloth-plate or the presser-bar of the machine. For the purpose of illustrating the invention I have represented its application to a gathering attachment made after the plan described in the reissued patents hereinbefore referred to.

The attachments represented in Figs. 1, 3, and 5 are, so far as concerns their general construction, essentially the same. Each comprises a frame, A; a sliding gatherer-plate, B, carrying a gathering-blade, C; an upper stationary holding-blade, D; an auxiliary foot or presser, E; an angle or elbow lever, F, with one of its arms working loosely in a slot in the gathering-plate B and the other arm formed and arranged to connect with the needle bar or arm; and an adjusting device, G, for determining the amount of lost motion of the lever-arm in the slot or recess in the gatherer-plate, for the purpose of regulating the length of gather. These parts are arranged and operate together substantially as described in the reissued Letters Patent before referred

to, and therefore require no detailed description here.

When the needle-bar rises the gathering-blade moves forward to make the gather, being compelled to thus move by the shorter arm of the lever F, which bears against the front end of the slot in the plate B, and pushes forward the latter, together with the blade C, which it carries. By the time the forward movement of the blade ceases its front end extends as far as and even beyond the path the needle follows when it descends. When the needle-bar commences to move downward the shorter arm of the lever will travel some distance in the slot in the gatherer-plate B before it will reach the rear end of said slot and begin to retract the gathering-blade, and during this time the needle will have descended far enough to bring its point down to or even below the gathering-blade. In order, therefore, to use an unslotted gathering-blade, it becomes necessary to move the blade back before the needle reaches it; and to this end I employ a device which, as soon as the needle commences its descent and before the lever F begins to act on the plate B, will retract the plate far enough to move it out of the path of the needle before the latter reaches it. The device which on the whole I prefer for this purpose is a small lever, H, vibrating upon an axis, *a*, on the frame A, having its lower end arranged to bear at the proper time against a shoulder, *b*, on the plate B, and its upper end arranged, at the time the lower end bears against the shoulder *b*, to engage with a pin or lug, *c*, or its equivalent, on the lever F. The top of the lever H has a slanting or inclined face, which lies under the pin *c*; and the center or axis *a* of the lever is in rear of a vertical plane passing through the point where the pin *c* bears on the inclined top of the lever H, which I shall call the "starting-lever." When the parts are in the position shown in Fig. 2 the longer arm of the lever F is raised to its highest point, at which time, as shown, the pin *c* is on the inclined top of the starting-lever, and the lower end of the latter is in contact with the shoulder *b* on plate B. When, therefore, the longer arm of the lever F descends, following the movement of the descending needle-bar, the pin *c* will at once be pressed down on the inclined top of the starting-lever; and owing to the arrangement of the center *a* it will cause the lever to tilt or vibrate, forcing the lower end of the starting-lever rearward, and as this end of the lever bears against the shoulder *b* the plate B, with its gathering-blade C, will at once be caused to recede. The movement of the starting-lever continues until the pin *c* slips off from the top of the same, at which time the gathering-blade will have been retracted sufficiently to entirely clear the needle. The remainder of the receding movement of the blade is effected by the shorter arm of the angle-lever in the usual way. When the needle-bar has completed its

descent the upper end of the starting-lever will be tilted forward, and the lower end correspondingly carried toward the rear; but the lever is, during the ascent of the needle-bar, caused to resume the position shown in Fig. 2 in a very simple way. When the longer arm of the angle-lever F rises, following the movement of the needle-bar, the plate B is advanced, and, as soon as the pin *c* clears the top of the starting-lever, shoulder *b* on plate B pushes against the lower end of said starting-lever, and carries it back to the position shown in Fig. 2, with the inclined top under the pin *c*, as before. Thus the starting-lever is actuated during the descent of the needle-bar by the angle-lever F, and during the ascent of the bar is brought back into position by the plate B. I am, therefore, enabled by this means to use an unslotted gathering-blade; and with it I can, if desired, use an unslotted holding-blade, as shown at D, Fig. 4, all that is required in this latter case being to arrange the end of the stationary blade a little back of the needle-hole or the path of the needle, as shown in Fig. 2. I prefer, however, on the whole, to slot the holding-blade in the usual manner, as shown in Figs. 6 and 8. The edges of both blades are preferably serrated, although they may be plain, if preferred, as seen in Fig. 6.

In the gatherer shown in Fig. 3 I have substituted in lieu of the starting-lever H a spring, I, which, in this instance, bears against the front of the plate B. When the plate is moved forward, the spring will, near the completion of this forward movement, be bent back far enough to cause it, as soon as the needle has commenced to descend, to at once push back, by its recoil, the plate B and its gathering-blade a sufficient distance to remove the gathering-blade from the path of the needle. The spring is so arranged as to act on the gatherer to this extent only, and the remainder of the backward movement of the gatherer is effected by the lever in the usual way. Still another starting device in lieu of the starting-lever or the spring is shown in Fig. 5. In this case I employ a cam-piece, J, provided with a slotted arm, *d*, and a cam or eccentric face, *e*. This cam is pivoted at *f* to the lower part of the frame A, and so that its cam portion *e* will work against a shoulder, *g*, on the plate B. The cam is shown detached in Fig. 8, and its position on the attachment, when the longer arm of the angle-lever F is at its greatest elevation, is substantially as shown in Fig. 8—that is to say, the slotted arm of the cam is nearly upright, and so that the least eccentric portion of the cam—for instance, at *h*—will be in contact with the shoulder *g* on plate B. The cam is caused to assume this position by means of a pin, *i*, on the shorter arm of the angle-lever F, which engages the slot in arm *d*, and at this time is at or near the lower end of the slot. As soon as the longer arm of the lever F begins to descend, the shorter arm moves back, and the pin *i* therefore traverses the

slot in arm *d*, and draws down said arm, causing the cam to turn on its axis *f* so as to bring its more eccentric portion *e* against the shoulder *g*. The plate B will thus be caused to move back far enough to remove the gathering-blade out of the path of the descending needle, and the remainder of the receding movement of the blade is effected by the angle-lever F, as usual.

I have described a few of the many ways in which my invention may be carried into effect; and while I prefer, as I have already stated, the arrangement shown in Fig. 1, yet I do not limit my claim to that arrangement, as it is manifest that various mechanical devices for the purpose may be used without departure from the principle of this invention.

What I claim, therefore, and desire to secure by Letters Patent, is—

1. In a gathering and ruffling attachment for sewing-machines, the combination, with a reciprocating gathering-blade and a vibratory lever for actuating the same, operating together substantially as specified, of the means herein described, or their substantial equivalent, whereby the gathering-blade, when the needle commences to descend, and before it reaches said blade, will be removed from the path of the needle, substantially as and for the purposes herein shown and set forth.

2. In a gathering and ruffling attachment, the combination of a reciprocating gatherer, a vibratory lever for imparting movement to the same from the needle bar or arm, and a starting-lever operated from said main vibratory lever to retract the gatherer out of the path of the needle when the latter commences to descend, and before the said main lever begins to act directly upon the gatherer, as set forth.

3. The combination of an upper stationary holding-blade, an under reciprocating gatherer having an unslotted gathering-edge, a vibratory lever for actuating said gatherer, and the means herein described, or the substantial equivalent of the same, for drawing back said gatherer from the path of the needle immediately upon the descent of the latter, and before the vibratory lever begins to act on the gatherer, substantially as herein shown and set forth.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALLEN JOHNSTON.

Witnesses:

B. R. HAMILTON,
A. G. HARROW.