

J. W. FURBUSH & J. PERLEY.
Feeding Device for Button-Hole Sewing-Machine.

No. 207,173.

Patented Aug. 20, 1878.

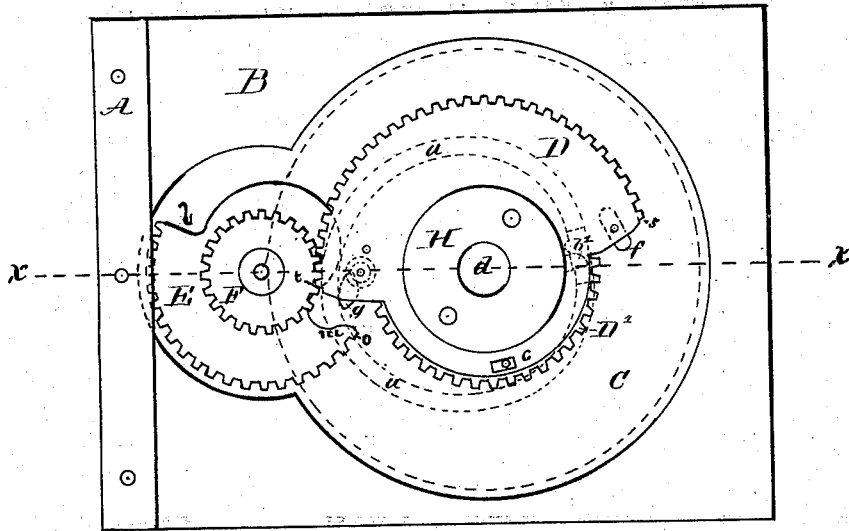


Fig. 1.

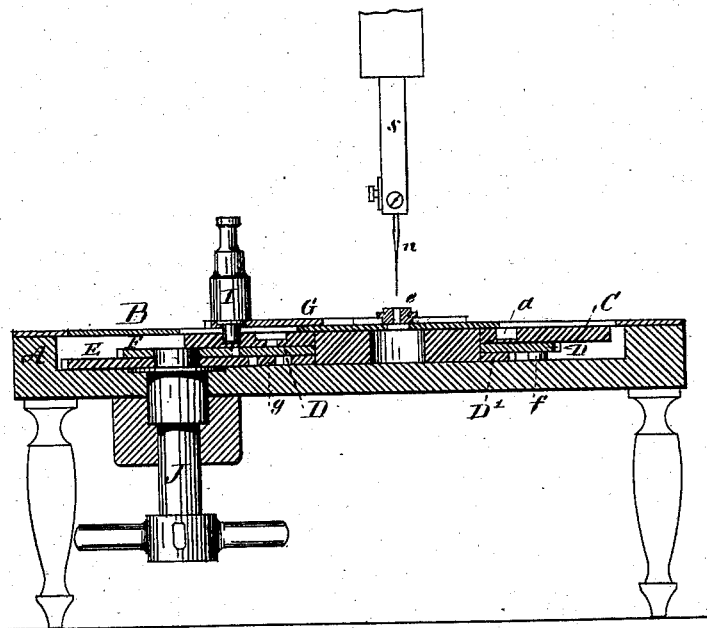


Fig. 2.

WITNESSES

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IMPROVEMENT IN FEEDING DEVICES FOR BUTTON-HOLE SEWING-MACHINES.

Specification forming part of Letters Patent No. 207,173, dated August 20, 1878; application filed March 26, 1878.

To all whom it may concern:

Be it known that we, JAMES W. FURBUSH and JOHN PERLEY, both of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented Improved Feeding Devices for Button-Hole Sewing-Machines, of which the following is a specification:

The invention consists of a mechanical movement whereby segmental and differential gearings are employed to produce, as required and in the same work, both slow and rapid motion without change of action in the machinery, and which movement is particularly adapted to that class of machines used for stitching button-holes, and which machine we take to illustrate said mechanical movement; and as applied to said machine we say our invention consists of a mechanical movement applied to a button-hole stitching-machine; and this movement as applied to said machine is effected by means of segmental and differential gearing in combination with a cam.

As we make no claim of invention or improvement in said button-hole stitching-machine, except in the movement of the feeding mechanism, we shall confine our specification, so far as we can, to that part of the machine, adopting the devices for communicating motion already in use.

Our invention also relates particularly to that class of button-hole machines where the needle-carrying box is moved laterally after each stitch by means of a cam. No button-hole stitching-machine of this class was in use prior to that invented by D. W. G. Humphrey, in 1862. In June, 1871, said Humphrey also obtained Letters Patent for improvements upon his first invention. In Humphrey's first invention there was employed a single feed-wheel, and in stitching the eye of the button-hole it was found necessary to increase the throw of the lever which turned the wheel, causing the ratchet to take more or less teeth at a throw, in order to give sufficient acceleration to the wheel in stitching the eye of the button-hole. This method did not give the desired result, and in his second invention Humphrey employs two cams, one the reverse of the other, having gears on their under sides, and between said cams a ring of the same diameter of the cams, having teeth meshing into

the gears of both cams; and thus he obtains a rotary movement to a clamp, carrying the work for spacing the stitches about the eye of the button-hole. This machine is complicated and liable to get out of order, besides being expensive and not well performing its work.

In our invention we employ a part of the same devices in operating the machine; but in spacing the stitches about the eye and to the entire button-hole we employ direct and positive motion by means of segmental and differential gears, in combination with a single cam, as aforesaid.

In the accompanying drawing, which is made a part of the specification, Figure 1 represents a plan of the said gearing, resting in a bed or recess in a table, over a part of which rests the said cam; (shown by dotted lines;) and Fig. 2 is a vertical section of the parts herein described in the line *x x*, Fig. 1.

The letter A represents a table; B, a slotted plate, (partly shown in Fig. 2,) covering the cam, gearing, &c.; C, the cam, (shown in Fig. 2 in section, and in Fig. 1 by dotted lines,) with its groove *a a*, (also in dotted lines;) D and D¹, the segmental gearing revolving about the hub H; E, a sector of the driving segmental gearing; and F, a spur or driving wheel having gear, and firmly attached to the driving-shaft J. (Shown in Fig. 2.) *f* and *g* are abutments upon the sector D. Said abutments *f* and *g* are fastened rigidly to the sector D by rivets or screws, as shown in Fig. 1, and the part thereof projecting outward from said sector at nearly a right angle, is rounded, so that the back of the sector E, next its first teeth, may strike upon the said abutments, so as to engage in an easy and sliding movement, the one gearing with the other, and said abutments operate also somewhat as drivers.

At *c* is a recess, in and through which passes a screw, which holds together the cam and the segmental gearing D². At *b'* is seen, in dotted lines, a driver. This is made fast to a slide on the under side of the cam C. (Not seen in the drawings.) *d* is a hole in the hub H, through which passes the needle. I is a clamp-pin, its lower part fitting into the groove *a a* in the clamp C, as shown in Fig. 2. The needle-button *e*, the needle *n*, and needle-holder S are shown in Fig. 2.

The levers, arms, and various other devices for running the machine, in sewing or stitching the button-hole, are not shown in the drawings.

In operating the machine the shaft J turns from left to right. The gearing designated E and F is fastened to said shaft, and when said shaft is turned the teeth of said gearing E and F engage the teeth of the gearing designated D and D¹, to which latter is fastened the cam C, and said cam C and said gearing D and D¹ revolve together about the hub H. This movement of the said parts forces the clamp-pin I along the channel *a a* through the slotted plate B, causing the clamp G, which carries the work to be stitched, to make a half-revolution—as, for instance, suppose the clamp-pin I in the position represented in Fig. 2, the machine being in working order, turning the shaft J from left to right, the feeding-clamp G, in the manner before named, moves along toward the eye of the button-hole, stitching one side of the same in the well-known way of stitching button-holes. When it reaches the eye the sector-gearing D is engaged by the driving gear-wheel F, causing the necessary accelerated speed in order to stitch properly the eye without change of motion; and when the gear of the sector D leaves the driving-wheel F the teeth of the gearing D¹ engage the teeth of the sector-gear E, and thus is completed the other side of the button-hole. The clamp G may then be raised by the clamp-pin I and moved around toward the left and placed in its first position to stitch a second button-hole.

It will be observed that when the sector E is about to engage the teeth of the gearing D¹ the back part of the sector at *l* (see Fig. 1) strikes the abutment *f* before the teeth of the gearing engage. This breaks the force and eases the engagement of the teeth of the gears, besides adding propelling force to the same; so

when the gear of the sector D is about to be engaged by the driving gear-wheel F the back part of the sector E, at *m*, strikes the abutment *g*, with the same result as before mentioned.

It will be observed, also, that the teeth of the gear at *o s t* are a little shortened, in order that they may engage the opposing gearing with less shock, thereby lessening the danger of breaking or injury to the gears.

Thus it will be seen that the described devices for the movement of the cam which causes the feeding-clamp movement and effects the stitching of the button-hole are new and effective in operation, and that motion, as herein applied and shown, is direct, positive, and complete; and that by the use of these devices there is no liability of failure or of breaking of parts, or of the same becoming disordered in the machine described. This machine movement also possesses the advantage of cheapness by at least one-third.

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

1. The combination of the external gearing E and F, which are secured to the shaft J, with the segmental gearing D, which has abutments *f* and *g*, the segmental gearing D¹, and the hub H, all combined together substantially in the manner and for the purpose shown and described.

2. In a button-hole stitching-machine, the driving gear-wheel F, secured to the shaft J, the segmental gear E, secured to said gear-wheel F, the segmental gear D, provided with abutments *f* and *g*, and the semicircular gear D¹, revolving about the hub H, in combination with the cam C, substantially in the manner and for the purpose shown and described.

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Witnesses:

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