

N. S. C. PERKINS.

Improvement in Feeding Mechanism for Sewing Machines.

No. 122,401.

Patented Jan. 2, 1872.

Fig. 1.

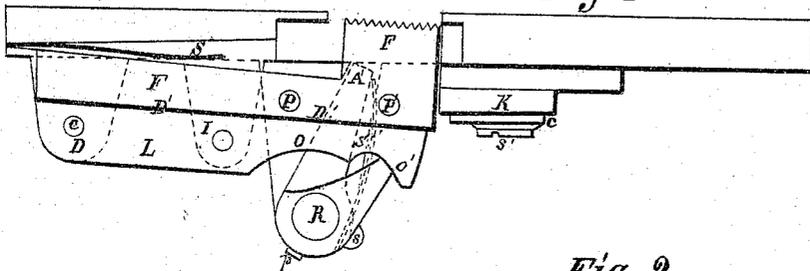


Fig. 2.

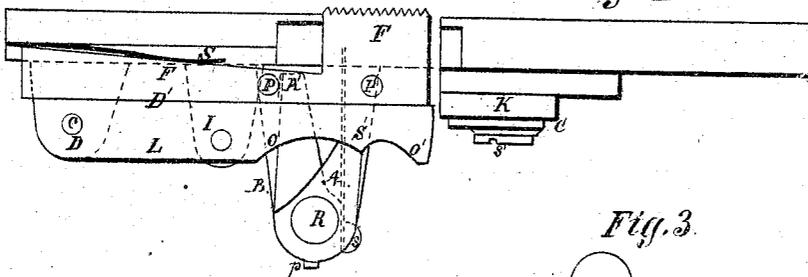
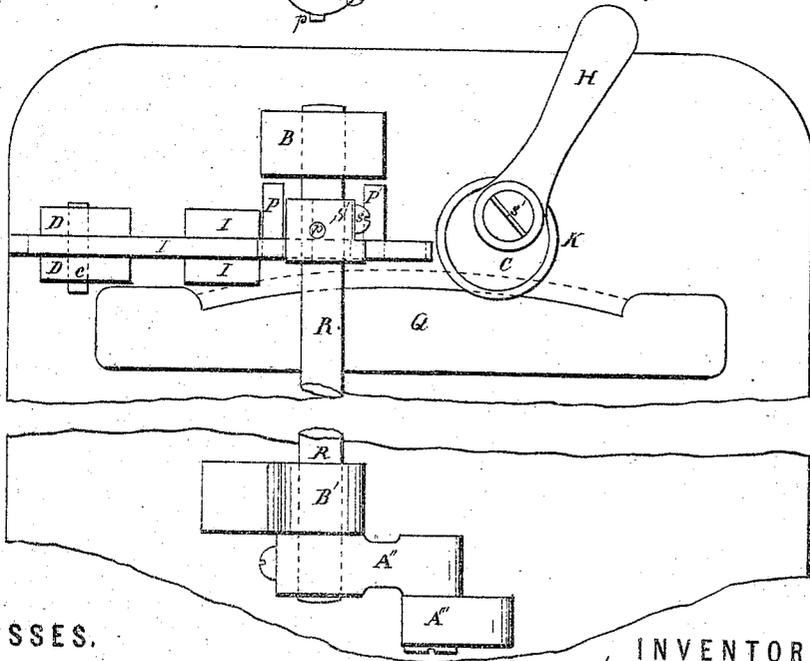


Fig. 3.



WITNESSES.

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IMPROVEMENT IN FEEDING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 122,401, dated January 2, 1872.

Specification describing certain Improvements in the Feeding Devices of Sewing-Machines invented by NAHUM S. C. PERKINS, of Norwalk, Huron county, Ohio.

My invention belongs to that class of feed mechanisms which is called "drop" or "four-motion" feed; and relates, first, to a divided feed-bar so arranged that the feed-teeth and actuating pins, projections, or stops are upon one part or division, which rests upon the other part or division, whose function is to alternately elevate and depress the upper division or feed-bar proper when it is itself so elevated and depressed by the arm located on the actuating rock-shaft for that purpose. My invention relates, second, to the devices for elevating, depressing, and carrying backward and forward the above-described parts, and also to the devices for regulating the length of the stitch and the various combinations growing out of the new relations of the different devices.

Figure 1 is a vertical cross-section cut on a line with one side of the feed-bar, showing the relation of parts at the beginning of the feed-movement. Fig. 2 is a like section, showing the relation of parts at the end of the feeding action. Fig. 3 is an under or bottom view, showing the feed devices attached to the under side of the cloth-plate of a sewing-machine.

A is an arm projecting from a collar secured to the rock-shaft, the end of which acts on the curved surfaces O O' of the lower division of the feed-bar L like a cam, causing elevation or permitting depression by the spring S, according to the part against which it presses. A¹ is another arm secured to the same collar on the same actuating rock-shaft, the function of which is to give the forward motion to the feed-bar F, and the fabric engaged thereby, through contact with and pressure upon the pin P of the same, and also to support the spring S' when it is at the opposite extreme limit of its movement. A² is a short arm secured to the rock-shaft, nearly on a plane with the lower straight edge of the feed-bar. A³ is the connecting-rod, by which a rocking motion is transmitted from a cam, say on an elevated shaft, to the rock-shaft R. B B' are the bosses or lugs cast on the under side of the cloth-plate, and used as bearings for the rock-shaft R. C is an ec-

centric cam, provided with a handle, H, for regulating the stitch. It rests on an eccentric leather disk, K, which receives the feed-bar F. c is a pin penetrating the two lugs D D, and acting as a pivot for the elevating-bar L. D D are two lugs, between which the two divisions of the feed-bar L and F rest, and by which they are kept from rolling or vibrating sideways, and thereby causing the fabric to advance in other than straight lines. D' D' indicate the line of division between the feed-bar proper F and the elevating-bar L. F is the feed-bar proper, provided with the usual projecting teeth, when actually feeding, through a slit in the cloth-plate and under the presser-foot. It rests on its edge along its whole length on, and slides when in action on, the flat edge of the elevating-bar L. I I are two lugs, supporting the feed-bars between them, and located as near as possible to the toothed surface, in order to assist the lugs D D in steadying said bars, while free perpendicular and endwise movement of the respective parts is permitted. K is a circular disk, of leather preferably, secured eccentrically under the circular part of the feed-regulating lever or handle H' by the screw s'. Its function is to regulate the length of the stitch by controlling or limiting the motion of the feed-bar F. L is the elevating portion of the feed-bar, on which the feed-bar proper F rests and moves. O is a part of a circle whose center, when the feed-bar proper F is about to move, is coincident with that of the rock-shaft R. O' is a curved edge of the elevating-bar L, also, the outer part of which has the same center as the curve O; but the inner part tends abruptly toward that center until it cuts the curve O. The function of the outer part of O' is to permit the spring S' to perform its office without further depression of the feed-bars; of the inner and abrupt part, to cause the elevating-bar L to be elevated, carrying the feed-bar proper F thereon; of the curve O, to maintain the level of the feed-bars when the toothed surface engages the fabric and carries it along; and also, to permit or cause all these to occur in reverse. P is a pin inserted firmly in the feed-bar proper F, which receives the pressure necessary to create the motion for the stitch, or spacing for the stitch, from the arm A¹, and communicates the same

to the said feed-bar. P' is a like pin inserted in the same bar, against which the spring S' strikes and causes the feed-bar to return to the starting point preparatory to repeating the series of movements. Q is the race and opening for access to the shuttle, looper, or other part of the mechanism. R is the rock-shaft which communicates motion, through its arms A A^1 and the spring S' , to the feed devices. S is a spring, the function of which is to depress the feed-bars whenever the arm A permits it to act, by its position on the curved surface or edge O' . S' is a spring secured to the same collar as A and A^1 , which gives the backward motion to the feed-bar proper F . s is a screw which secures the spring S' to the collar of the arms A and A^1 . s' is the screw which holds the eccentric or feed-regulating cam. p is a pin securing the collar of A and A^1 to the shaft R .

The operation of my invention is as follows, viz.: Beginning with the parts in the relative positions represented in Fig. 1, the arm A^3 being drawn up or let down communicates a rocking motion to the shaft R at the proper times and in suitable co-ordination with the other mechanisms. In the early part of the motion of the rock-shaft R , starting from the positions represented in Fig. 1, the pin P' is released from the pressure of the spring S' . At the same time the end of the arm A begins to slide along the outer part of the curve O' , and as it proceeds it eventually strikes the inner slope thereof, which rises toward the center of motion of the rock-shaft R , and, proceeding up this slope, the elevating-bar L is pushed from the rock-shaft, lifting with it the superimposed part or feed-bar proper F until the teeth thereof come in contact with the fabric to be fed, and up to this time without endwise motion, but the two parts turning together on the pivot c . When the end of the arm A has fully surmounted this slope of the curve O' the pad on the arm A^1 has reached the pin P . The motion of the rock-shaft now continuing, the feed-bar F is moved by the arm A^1 in contact with the pin P , being slid bodily on the edge of the elevating-bar L , on which it rests, and carrying the fabric in the usual manner between the roughened surface and the presser-foot until the stop or limit thereof is reached. During this motion and action of the arm A^1 the arm A , being rigidly secured to or projecting from the same collar and shaft, must also move up-

on the segment of a circle, O ; but this, being coincident with a circle described from the center of the rock-shaft R , simply maintains the level of both the feed-bars or keeps it unchanged throughout, whereas, if this curve had any other center, they would tend to be elevated or depressed, as the case might be. During the elevation, and also during the sliding of the bar F , the resistance and friction of the spring S is to be overcome, and upon the reversed movement of the rock-shaft both feed-bars are taken in charge thereof so soon as the end of the arm A has passed the projecting angle caused by the junction of the two curves O and O' . As the arm A passes down the most abrupt part of O' the spring S causes the feed-teeth to drop free from the fabric, and presently the spring S' engages the pin P' . The feed-bar F is thereby moved backward until it comes in contact with the feed-regulating eccentric K , and the parts are ready for a repetition of the operation. The function of the spring S' is to return the feed-bar F to position, which requires but little force, and while so doing it permits, by its flexibility, the complete and undisturbed action of all the parts of the sewing-machine, whatever position the eccentric disk K may occupy, as it would not do if it were a fixed or rigid arm, like A^1 , performing or attempting to perform the same office.

Of course, a proper distribution of oil on the parts where friction occurs will facilitate the operation of the devices.

I claim as my invention—

1. The elevating-bar L and the sliding feeding-dog F , the former being shaped substantially as described, for the purpose set forth.
2. In combination with the elements of the first claim, the arms A and A^1 , the first, A , operating to elevate the bars and maintain their elevated level while feeding, and the second operating to push or slide the feed-bar proper F and the engaged fabric.
3. The combination, with the feeding-bar F and its regulating-stop or eccentric K , of the arms A and A^1 and the spring S' , for the purpose of retreating the feed-bar varying distances.

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Witnesses:

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