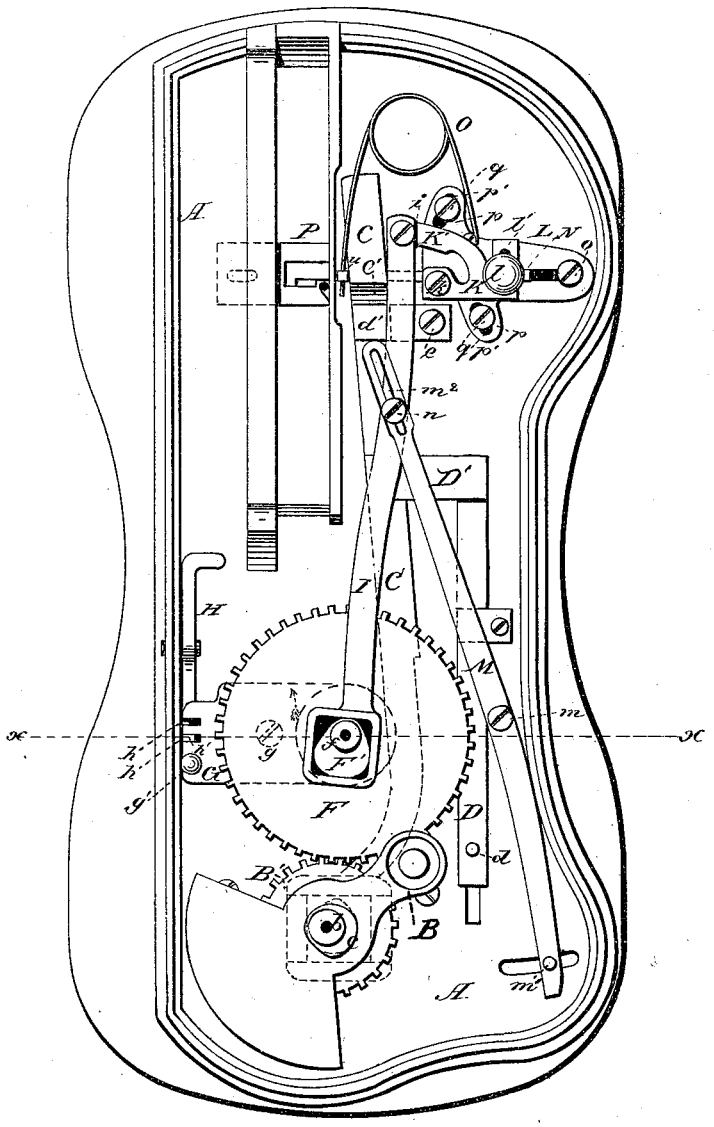
2 Sheets—Sheet 1.

M. CHRISTOPHERSON.

FEEDING-MECHANISM FOR SEWING-MACHINES.

No. 193,691. Patented July 31, 1877.

Fig. 1.



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C. A. Snow
Jno. P. Brooks

Inventor
M. Christopherson
by Louis Bagger & Co.
his attys.

2 Sheets—Sheet 2.

M. CHRISTOPHERSON.

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Fig. 2.

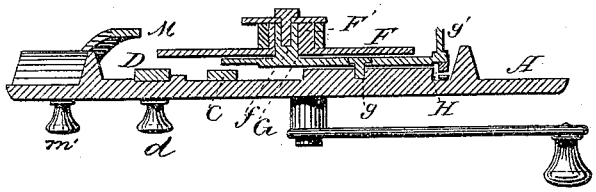


Fig. 3.

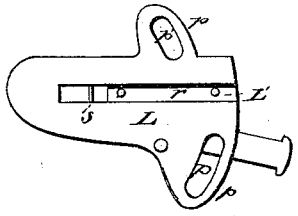


Fig. 4.

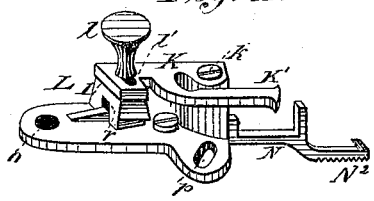


Fig. 5.

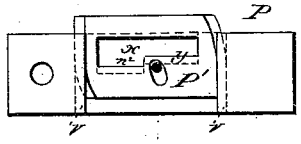


Fig. 6.

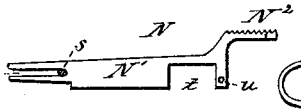
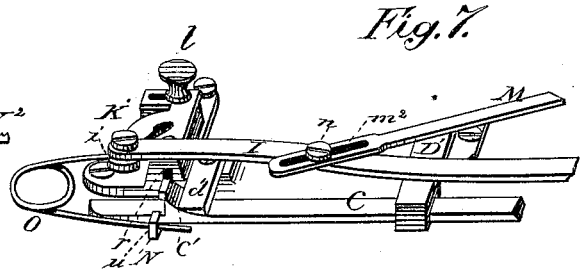


Fig. 7.



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UNITED STATES PATENT OFFICE.

MATHIAS CHRISTOPHERSON, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN FEEDING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **193,691**, dated July 31, 1877; application filed December 13, 1876.

To all whom it may concern:

Be it known that I, MATHIAS CHRISTOPHERSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to the feeding mechanism of sewing-machines, and has for its object to produce a feed-motion that may readily be changed from a four-motion, or up-and-down and forward-and-backward motion, to a six-motion, adding two lateral or side motions by a simple and easy adjustment of certain parts, as hereinafter more fully described.

By my improvement a sewing-machine may be used with equal facility for ordinary sewing, which requires only a four-motion feed, and for ornamental stitching, embroidery, or the working of button-holes, which require a six-motion, while at the same time the length or throw of the respective motions may be easily regulated.

In the annexed drawing, Figure 1 is a plan of the under side of the bed-plate. Fig. 2 is a vertical section through the plane indicated by line *x x* in Fig. 1. Fig. 3 is a plan view of the under side of the oscillating feed-bar. Fig. 4 is a perspective view of the reciprocating feed-bar and dog. Fig. 5 is a plan of the under side of the feed-plate. Fig. 6 is a side view of the feed-dog detached, and Fig. 7 is a perspective edge view of the feed-slide and front of oscillating bar.

Similar letters of reference indicate corresponding parts in all the figures.

A is the bed-plate, and B represents the crank operating the shuttle-driving mechanism, which may be of any desired character or construction, and is not shown on the drawing. C is the feed-slide, to which a reciprocating motion is imparted by a cam, *c*, keyed upon the shaft *b*. D is a bar sliding in a groove or depression in the bed-plate, and having an arm, D′, projecting at right angles, as shown. The bar D may be moved forward or backward, and is kept permanent in any desired position by means of a set-screw, *d*, that projects up through a slot in the bed-plate. Feed-slide C passes under the arm D′ of bar D, between two studs, which form an adjustable fulcrum for slide C, by means of which a vibrating motion is imparted to the latter, the length or throw of the vibrations being controlled and regulated by the position of bar D. The forward end of slide C has a beveled or inclined shoulder, C′, which works against a beveled strap, *d′*, rigidly secured upon a stud that projects downward from the bed-plate by means of the screw *e*.

This arrangement—that is, the combination of the feeding-slide C, having the beveled shoulder C′, with the adjustable control-bar D and rigid beveled strap *d′*—will, when the slide C is operated by its cam, impart to it a combined vibrating and up-and-down motion. The forward end of slide C rests in a notch in the feed-dog, (the detailed construction and operation of which will be hereinafter described,) giving to the latter a forward-and-backward and up-and-down or four motion, such as is generally used when a sewing-machine is used for ordinary sewing, such as stitching, hemming, &c.

F is a gear-wheel, pivoted upon a short stud, *f*, that is affixed upon an oscillating plate, G. The latter is pivoted on a stud, *g*, and has a knob, *g′*, by means of which it may readily be swung on its pivot *g*. *h h* are notches in the edge of the plate, and H is a lock-lever, terminating in the catch *h′*, that interlocks with the notches *h*.

In the position of plate G shown in the drawing, gear-wheel F meshes with wheel B′; but when the plate G is swung in the direction of the arrow, by unlocking the lever H and slipping its point or catch *h′* into the other notch, *h*, farthest from wheel B′, the two wheels F and B′ will be brought out of gear. Affixed upon wheel F is a cam, F′, operating the rod I, which carries a clutch, *i*, at its end, by means of which it engages with a bent arm, K′ of the plate K. The latter is pivoted at *k* upon the oscillating feed-bar L, but may be secured rigidly upon the latter by means

of the thumb-screw *l*, that passes through a slot, *l'*, in plate K. M is a bar, pivoted at *m* upon a downward-projecting stud, and having a set-screw, m^1, at one end, which projects up through a segmental slot in the bed-plate A. At the other end there is a slot, m^2, which forms a guide for a stud-screw, *n*, secured upon the rod I.

By this arrangement—that is, the combination of the rod I with the swinging bar M and bent arm K' of plate K—the clutch *i* may be adjusted upon arm K' in such a manner as to regulate the motions or vibrations of plate K when this is not rigidly secured upon the feed-bar L by thumb-screw *l*.

Feed-bar L is pivoted on a screw, *o*, and has two ears, denoted by *p p*, each of which has a segmental slot, *p' p'*, within which are the set-screws *q q*. By tightening these two screws, feed-bar L will be rigidly affixed upon the under side of the bed-plate; but when they are loosened, plate L may oscillate freely on its pivot-screw *o*.

Thus it will be observed that when wheels B' and F are geared the reciprocating rod I will impart an oscillating motion to plates K and L, provided that these two are rigidly secured together by the thumb-screw *l;* but when the screw is loosened the plate K only will oscillate on its pivot *k*, while plate L will remain stationary. The throw of plates K and L is regulated or controlled by the control-bar M, in the manner already described.

The plate or feed-bar L has a raised step or shoulder, L', which is recessed longitudinally and vertically, as represented by the letter *r*. Within this recess slides the feed-dog N, the shape of which is shown in Fig. 6. *s* is a pin or cross-piece (see Fig. 3) inserted in the recess *r*, so as to form a guide for the slotted shoe N^1 of the feed-dog N, the forward part of which has a notch, *t*, for the insertion of the feeding-slide C, as already described. O is a pull-spring, one end of which is secured upon plate L, and the other end is inserted into a perforation, *u*, in the forward part of the dog N, so as to pull this tightly against the under side of slide C, for the purpose of securing uniformity and evenness of the up-and-down motions.

The feed-plate B consists of two parts, viz., an upper and a lower plate, the letter P', Fig. 5, representing the latter. Plate P' slides in grooves (denoted by *v v*) in the under side of the upper or main plate P, and has a slot, *x*, corresponding to the perforation *y* in plate P, so that the lateral motions of plate P', when the six-motion is in operation, shall not interfere with the working of the needle and sewing mechanism. Plate P' is moved by the feed-stop N^2 of dog N, pushing against the sides of the slot n^2, the bed-plate A being recessed in its upper face, so as to give room for the lateral motions of plate P'.

From the foregoing description the operation of my improved feeding mechanism will be readily understood. When the wheels F and B' are out of gear the motion of the feed-dog N will be simply fourfold, viz., up, forward, down, and backward; but when wheels F and B' are meshed (the set-screws *q q* being at the same time loosened and thumb-screw *l* tightened) a reciprocating lateral motion is added to these, so that a six-motioned feed is obtained.

The throw of the respective motions may be readily gaged by means of the control-bars D and M, in the manner that has already been described.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of shaft *f*, carrying the wheel F and cam F', with the feed-rod I, pivoted control-bar M, clutch *i*, and plate K, substantially as and for the purpose herein shown and described.

2. The oscillating and adjustable feed-bar L, having recess *r* and slots *p' p'*, in combination with the set-screws *q q* and reciprocating feed-dog N, substantially as and for the purpose herein shown and described.

3. The combination of shaft *f*, carrying the wheel F and cam F', feeding-rod I, plate K, thumb-screw *l*, oscillating and adjustable feed-bar L, and set-screws *q q*, substantially as and for the purpose hereinbefore set forth.

4. The oscillating feed-bar L, having recess *r*, in combination with the feed-dog N and the feed-plate P P', substantially as and for the purpose herein shown and described.

5. In the feeding mechanism of a sewing-machine, the combination of the following operating elements, to wit: the feed-slide C, cam *e*, gear-wheel B, adjustable gear-wheel F, cam F', reciprocating rod I, pivoted plate K, control-bar M, oscillating feed-plate L, feed-dog N, and feed-plate P P', all combined and arranged to operate substantially in the manner and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

MATHIAS CHRISTOPHERSON.

Witnesses:
O. K. HONGER,
HANS GABRIELSON.