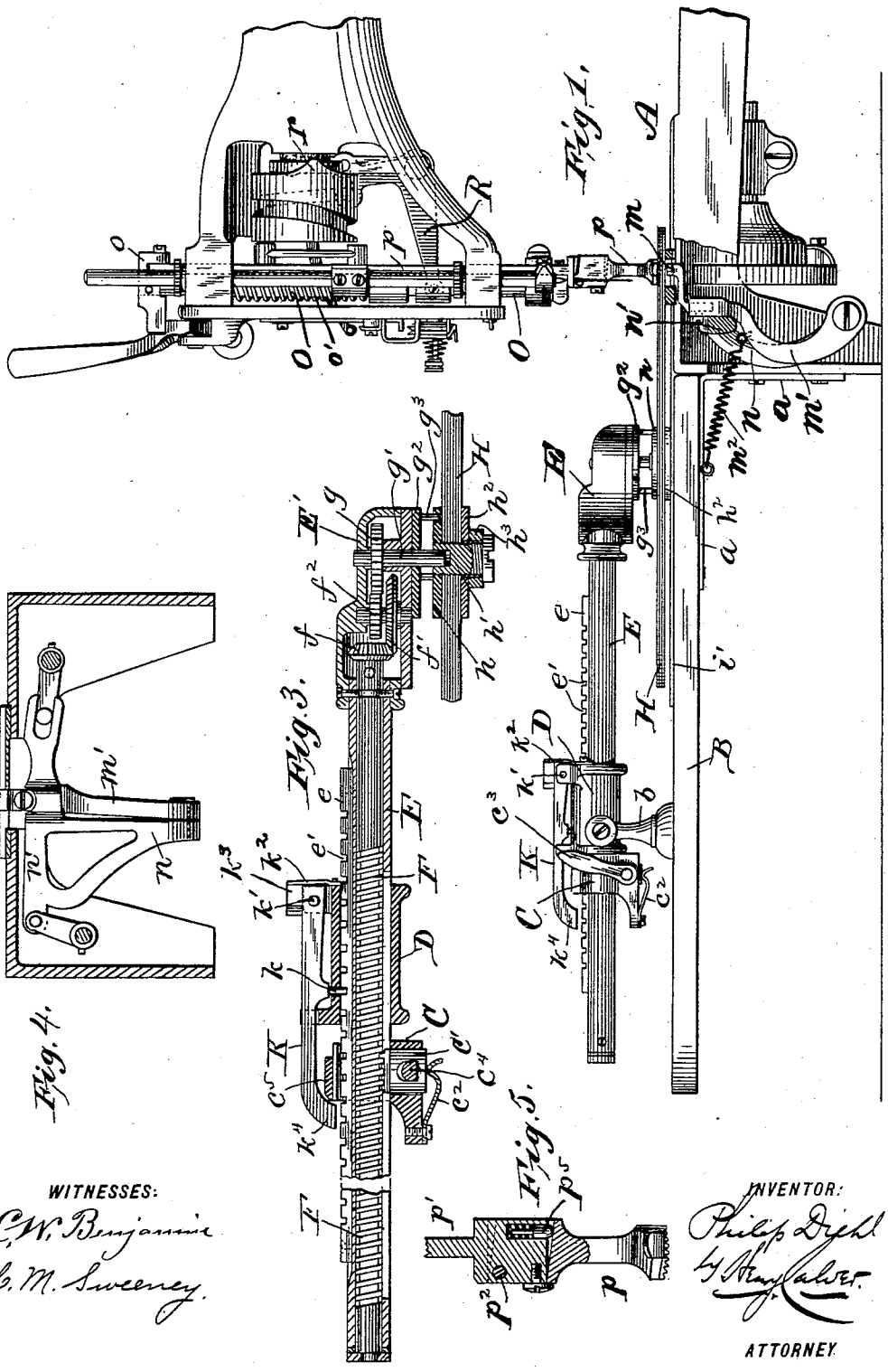
(No Model.) 2 Sheets—Sheet 1.

P. DIEHL.

PAD STITCHING ATTACHMENT FOR SEWING MACHINES.

No. 564,598. Patented July 28, 1896.



WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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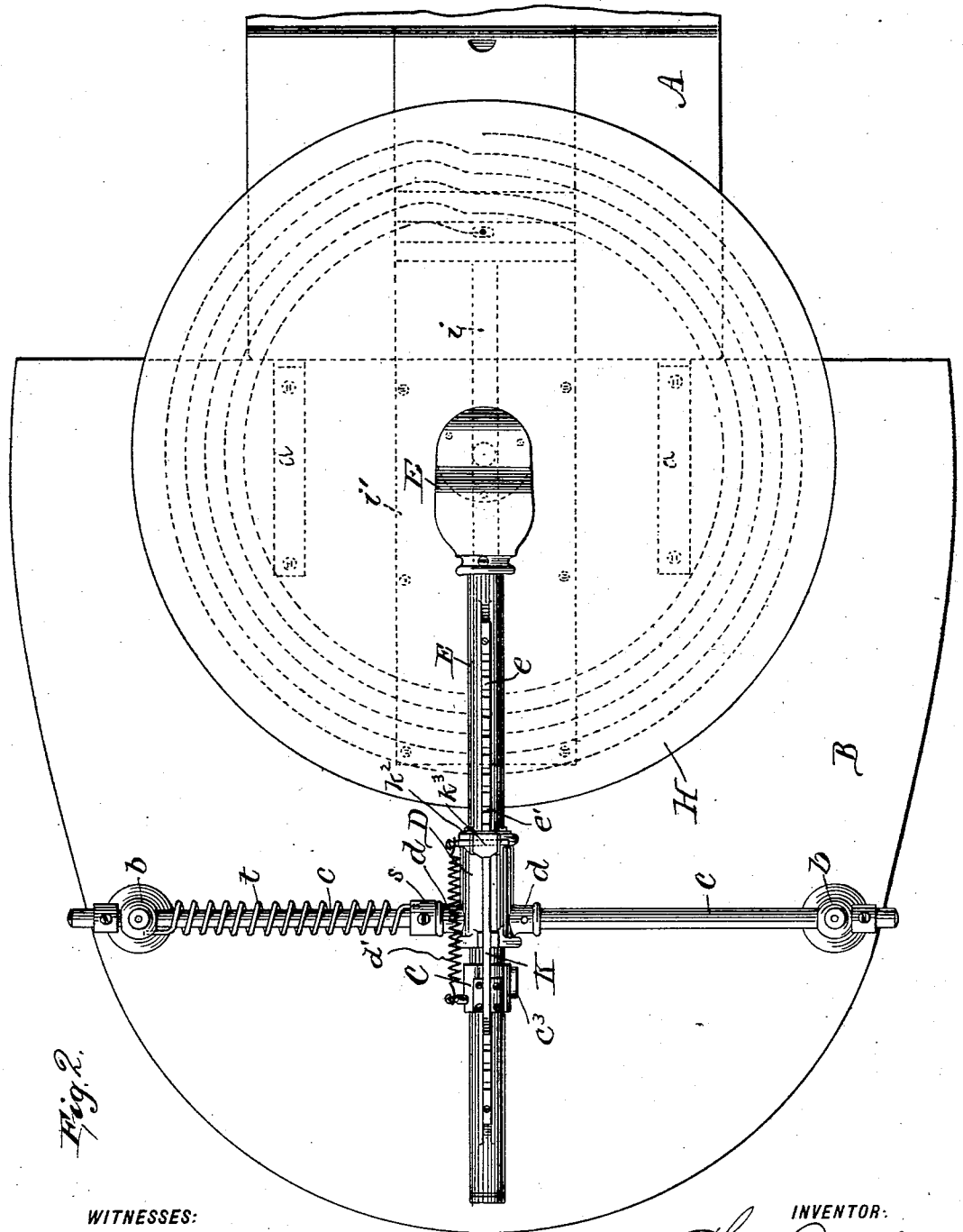

Fig. 2.

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UNITED STATES PATENT OFFICE.

PHILIP DIEHL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF NEW JERSEY.

PAD-STITCHING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 564,598, dated July 28, 1896.

Application filed May 26, 1896. Serial No. 593,140. (No model.)

To all whom it may concern:

Be it known that I, PHILIP DIEHL, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Pad-Stitching Attachments for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of appliances to be used with sewing-machines for the purpose of stitching buffing-pads and similar circular articles by a series of circular seams. In the devices heretofore employed for this purpose the buffing-pads were stitched by helical seams running spirally from the peripheries or outer parts of the pads inward toward their centers, but the pads stitched in this manner were open to the objection of always having more or less of the sewing-threads extending loosely from their outer edges as they were worn away in use, as some part of the spiral or helical seam of a pad was necessarily always exposed at the edge thereof as the pad was worn down.

This invention has for its object to provide a mechanism whereby buffing-pads or similar articles may be stitched by a series of concentric parallel seams, the work being automatically shifted, after each circular seam is completed, for the sewing of the next circular seam. When a pad which has been stitched in this manner is worn down in use until the sewing-threads of a circular seam are exposed at the edge or periphery thereof, the entire circle of stitches may be pulled out or removed, so that there will be no further annoyance to the user of the pad until the latter is worn down to the next seam, when the pulling-out operation may be repeated, and so on until the pad is worn out.

In the accompanying drawings, Figure 1 is a side view illustrating the invention, and Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section of the attachment. Fig. 4 is a partial end view of the machine, with the frame in section to show the feeding devices. Fig 5 is a detail view of the pivoted presser-foot.

A denotes a portion of the work-plate of a sewing-machine, to which is attached, as by brackets *a*, the table B, provided with standards *b*, apertured at their tops for the reception of rods *c*, the inner ends of which enter hollow ears of projections *d* formed on a sleeve D, through which passes a tube E, thereby pivotally supporting said sleeve and tube on said standards. Within the tube E is inclosed a screw-shaft F, provided at its inner end with a bevel-gear *f*, meshing with a second bevel-gear *f'*, connected by intermediate gears f^2 *g*, with a short vertical shaft *g'*, journaled in a box or casing E', supporting the inner end of the tube E. The shaft *g'* is provided below said box or casing E' with a disk g^2, having pins g^3 to enter holes in the top member or disk *h* of a rotating and sliding clamp which holds the pad H to be stiched, said clamp, as herein shown, comprising the screw *h'*, the disk h^2, through which and the collar h^3, interposed between said disk h^2 and the head of said screw, the screw-shank loosely passes, and the said disk *h*. The central hole in the disk *h* is tapped for the reception of the threaded shank of the screw *h'*, so that the material to be stitched may be clamped between the disk h^2 and *h* either by tightening said screw or by turning the disk *h* down on the screw. The head of the screw *h'* fits in a guideway or groove *i*, formed in a plate *i'*, attached to the table B.

The construction thus far described is essentially the same as that embraced by United States patent to Mallett, No. 390,685, dated October 9, 1888, and on which the present invention is an improvement, consisting of means whereby the tube E may be moved or fed intermittingly with relation to the sleeve D, instead of continuously, as heretofore. To this end the tube E is provided with a bar *e* having a series of notches *e'* to be successively engaged by a pin or lug *k* on a lever K pivoted at *k'* to the sleeve D, the outer or free end of said lever being pressed downward to hold said lug or pin in engagement with said notches by a plate-spring k^2 pressing on the lug k^3 at the inner end of said lever.

C is a sleeve or traveler surrounding the tube E and inclosing a toothed dog *c'*, normally held in engagement with the screw F by a spring c^2, but capable of being disengaged from said screw when desired by turn-

ing the handle c^3, fast on a small cam-shaft c^4. When the dog c' is in engagement with the screw-shaft F and the latter is in rotation, a continuous traveling movement will be imparted to the sleeve C, but as the tube E slides freely through said sleeve, or, more properly, as said sleeve is free to travel loosely longitudinally of said tube, the latter will remain at rest until such time as the feeding movement is to occur to shift the work after the completion of a circle of stitches for the purpose of making a new circular seam.

The pad H, it will be understood, is rotated for the circular stitching by the sewing-machine feed, as heretofore, and when a circle of stitches has been completed the sleeve C, caused to travel longitudinally of the tube E by the screw-shaft F, will have moved far enough to engage the forward end of the lug c^5 at the top of said sleeve with the depending projection k^4 at the forward end of the lever K, and thereby lift said lever to disengage the lug or pin k thereof from a notch of the bar e, thus unlocking the tube E from the stationary sleeve D and leaving said tube free to be fed along to shift the work for a new circle of stitches, this shifting operation being effected by lateral movements of the presser-foot and feed of the machine, preferably assisted by a spring d', yieldingly connecting the sleeves D and C, and exerting its force to move the sleeve C and the sliding tube E inward when not prevented from so doing by the locking lug or pin k.

The feed-dog m (the feeding movements of which are or may be those of the well-known Singer oscillating-shuttle machine) is carried by an arm m', pivoted at its lower end to a rigid arm n depending from the feed-bar n', so that said feed-dog is adapted to be moved laterally. The presser-foot p is carried by a swinging bar p', pivoted at its upper end to a bracket o secured to the presser-bar O, said swinging bar p' permitting the presser-foot to move forward with the work as the latter is moved by the feed, the said presser-bar being lifted at each stitch by the lever R, operated by the cam r, so that the swinging bar p' may be returned to its initial position by a suitable spring. The roller-stud with which said lever R is provided is held in contact with said cam by the action of the spring o', which depresses the presser-bar. The presser-foot p is pivotally attached to a block or bracket at the lower end of the bar p' by a pin or screw p^2, which is located eccentrically to and outside of the line of the center of said foot, so that when the latter is forced down upon the work with the usual spring pressure it will have a tendency to tilt laterally inward, and thus move the work laterally, the pivoted feed-dog moving freely laterally therewith. The pivot of the feed-dog arm is also preferably eccentric to or outside of the vertical line of the center of said dog to facilitate this lateral movement.

When the locking lug or pin k is engaged with a notch of the bar e, the work is restrained thereby from any lateral movement by the presser-foot and feed, but when said locking lug or pin is withdrawn from a notch of the bar e at the completion of a circle of stitches the lateral movements of the presser-foot and feed, assisted by the spring d', cause the work to be moved diagonally for two or three stitches, or until the next notch e' of the bar e comes beneath the pin k, when the latter snaps into such notch, thus again locking the tube E to the fixed sleeve D, so that the pad being stitched will now rotate without lateral movement until the next circle of stitches is completed, when the shifting operation will again be repeated, and so on until the pad is fully stitched by concentric rows of stitches. After the presser-foot has tilted laterally and been moved forward with the work, it will, when lifted from the work, be returned laterally to its normal vertical position by the spring-pressed pin p^5, and the laterally-moving feed-dog is also returned to its normal lateral position when the presser-foot is lifted by the spring m^2.

To hold the box E' at the inner end of the tube E down on the work, to keep the pins g^3 of the disk g^2 in engagement with the disk h of the rotary work-clamp, the collar s, rigidly connected with the sleeve D, is joined by a torsional spring t with one of the standards b.

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

1. The combination with the stitch-forming and feeding mechanism of a sewing-machine, of means for pivotally holding a pad or other article so that it may be rotated by said feeding mechanism, to produce circular rows of stitches, and automatic mechanism, operating intermittingly or at the completion of each circle of stitches, to shift the work laterally; whereby an article may be stitched by a continuous seam consisting of concentric circles of stitches joined by lateral or diagonal stitches.

2. The combination with a pad-stitching attachment comprising a rotary work-holder, a screw-shaft, and gearing and intermediate devices connecting said work-holder and screw-shaft, whereby the latter may be rotated by the former, of a sewing-machine provided with a laterally-movable presser-foot and feed-dog, means for locking said screw-shaft from endwise movement to prevent the work from being moved laterally by said presser-foot and feed-dog, and automatic mechanism for releasing said locking device at intervals to permit the said presser-foot and feed to shift the work laterally after each rotation of said work-holder by the feed of the machine.

3. The combination with a pad-stitching attachment comprising a rotary work-holder, a screw-shaft, gearing and intermediate devices connecting said work-holder and screw-

shaft, whereby the latter may be rotated by the former, a sliding tube inclosing said screw-shaft and connected with said work-holder, a fixed sleeve or support in which said sliding tube can move, a locking device for connecting said tube with said support, and a traveler, moved by said screw-shaft, for releasing said locking device at intervals, of a sewing-machine provided with a laterally-movable presser-foot and feed-dog serving to shift the work laterally when said locking device is released.

4. The combination with a pad-stitching attachment comprising a rotary work-holder, a screw-shaft, gearing and intermediate devices connecting said work-holder and screw-shaft, whereby the latter may be rotated by the former, a sliding tube inclosing said screw-shaft and connected with said work-holder, a fixed sleeve or support in which said sliding tube can move, a locking device for connecting said tube with said support, and a traveler, moved by said screw-shaft, for releasing said locking device at intervals, of a sewing-machine provided with a laterally-movable presser-foot and feed-dog serving to shift the work laterally when said locking device is released, and a spring yieldingly connecting said traveler with said fixed support or sleeve and serving to assist said presser-foot and feed-dog to shift the work laterally.

5. The combination with a sewing-machine provided with a presser-foot pivoted eccentrically or at one side of the line of its center, and with a pivotally-supported feed-dog, of a pad-stitching attachment comprising a rotary work-holder, a sliding tube connected with said work-holder, a stationary sleeve or support for said tube, a locking device for connecting said sleeve and tube, a screw-shaft in said tube, gearing connecting said work-holder and screw-shaft, whereby the latter may be rotated by the former, and a traveler moved by said screw-shaft and serving to disengage said locking device at intervals to release said tube from its stationary support or sleeve when the work is to be shifted laterally.

6. The combination with a sewing-machine provided with a presser-foot pivoted eccentrically or at one side of the line of its center, and with a pivotally-supported feed-dog, of a pad-stitching attachment comprising a rotary work-holder, a sliding tube connected with said work-holder, a stationary sleeve or support for said tube, a locking device for connecting said sleeve and tube, a screw-shaft in said tube, gearing connecting said work-holder and screw-shaft, whereby the latter may be rotated by the former, a traveler moved by said screw-shaft and serving to disengage said locking device at intervals to release said tube from its stationary support or sleeve when the work is to be shifted laterally, and a spring yieldingly connecting said traveler and stationary support and serving to assist the presser-foot and feed-dog in shifting the work.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP DIEHL.

Witnesses:
HENRY CALVER,
JOSEPH F. JAQUITH.