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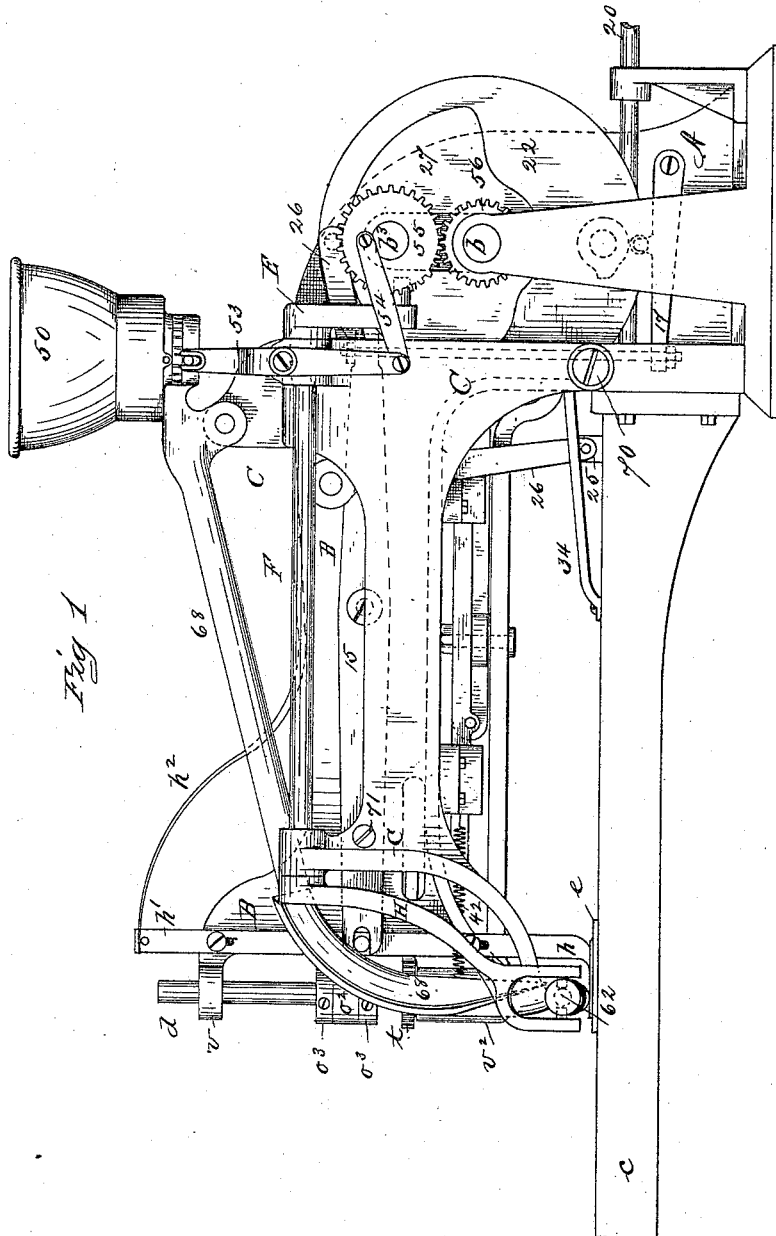
2 Sheets—Sheet 1.

H. H. CUMMINGS, W. E. BENNETT & R. THOMPSON.

MACHINE FOR STITCHING BUTTONS TO FABRIC OR OTHER MATERIAL.

No. 343,948.

Patented June 15, 1886.



WITNESSES:
Henry A. Chapin
W. F. Rice

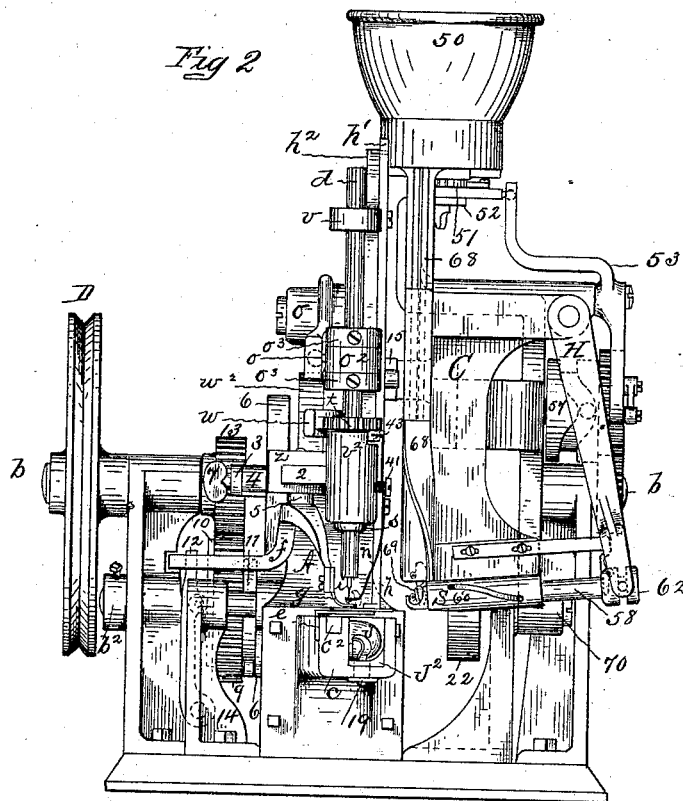
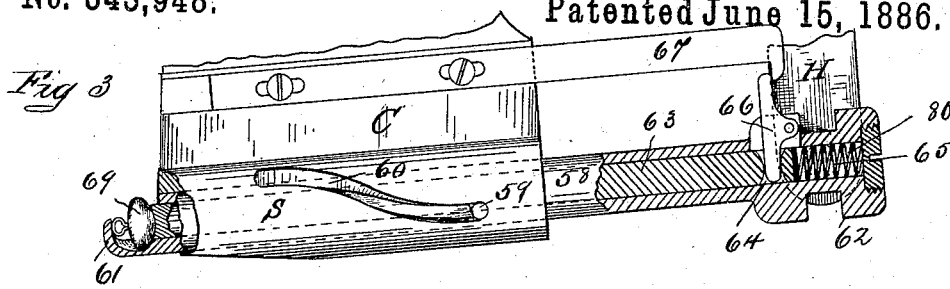
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By *Henry A. Chapin*
ATTORNEY

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UNITED STATES PATENT OFFICE.

HENRY H. CUMMINGS, OF MALDEN, AND WALTER E. BENNETT AND ROSEWELL THOMPSON, OF BOSTON, ASSIGNORS TO THE MORLEY SEWING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

MACHINE FOR STITCHING BUTTONS TO FABRIC OR OTHER MATERIAL.

SPECIFICATION forming part of Letters Patent No. 343,948, dated June 15, 1886.

Application filed December 19, 1885. Serial No. 186,124. (No model.)

To all whom it may concern:

Be it known that we, HENRY H. CUMMINGS, WALTER E. BENNETT, and ROSEWELL THOMPSON, citizens of the United States, and residing in the State of Massachusetts, said CUMMINGS at Malden, county of Middlesex, said BENNETT at Boston, county of Suffolk, and said THOMPSON at Boston, county of Suffolk, have jointly invented new and useful Improvements in Machines for Stitching Buttons to Fabric or other Material, of which the following is a specification.

This invention relates to improvements in machines for stitching buttons to fabric, leather, &c., the object being to provide improved devices for forming stitches through fabric and the eyes of buttons, and to provide suitable button-feeding mechanism to operate in conjunction with said stitching devices to place buttons automatically under the needle thereof and on the fabric at the place where they are to be attached.

In the drawings forming part of this specification, Figure 1 is a side elevation, and Fig. 2 is an end elevation, of a machine for sewing buttons onto fabric embodying our invention. Fig. 3 is a front elevation, partly in section, of the devices for conveying buttons from the trough leading from the hopper to the sewing devices and the lower end of the frame in which the button-carrier is supported.

In the drawings, 50 is a button-hopper having a perforated bottom, and 68 is a button-trough into which buttons drop through said bottom, said hopper and trough being constructed and operating substantially in the manner shown and described in Patent No. 265,532, October 3, 1882, to which reference may be had. Buttons from said hopper are conveyed by trough 68 to button-carrying devices, hereinafter described, and by the latter are placed in proper position to be sewed onto the fabric.

A is the frame of the machine, in which the shafts b and b^2 have suitable bearings, the former being the driving-shaft, and consequently is provided with the driving-pulley D, and the latter a secondary shaft driven by the former through suitable gear-connection. A third

short shaft, b^3 , Fig. 1, is driven by a gear-connection with shaft b , one end of shaft b^3 having a bearing in a standard on the base of frame A, as shown. A horn, c , Fig. 2, projects forward from said frame, in which is the shuttle-race J^2 , in which a shuttle, J, has the usual to-and-fro movements.

B is the arm of the machine, extending in a line over said horn, and e is the cloth-plate secured to the latter under the needle-bar d .

The present invention relates specially to the button-conveying mechanism, as hereinafter set forth in the claims.

The organized stitching mechanism of the herein-referred-to machine, to which are applied the above-mentioned button-feeding devices, is that described and shown in another application for "improvements in sewing-machines," which we have filed of even date herewith, to which the Patent Office has given the Serial No. 186,125.

The operative mechanism necessary to carry out the invention consists (in addition to said shuttle) of the following elements, and suitable mechanism for operating the same, viz: The presser-bar h , carrying the presser-foot h , hung on the side of arm B, as shown, to which is given the usual properly-timed vertical motions by the lever 15, pivoted on the side of arm B, and having the requisite vertical motions. A spring, h^2 , attached to said arm, bears on a pin in the side of the presser-bar. The needle-bar d , supported in bearings $v v^2$ on the end of the arm B, has a bushing, s , interposed between it and said bearing v^2 , and between the needle-bar and said bushing is a spline-and-key connection. A pinion, t , is secured to the upper end of said bushing, and is engaged with a rack, w , on the end of a connecting-rod, which has a reciprocating end-wise movement, whereby the needle-bar is given a reciprocating rotary motion. A vibrating needle-bar lever, o , (shown in end view in Fig. 2,) is pivoted on the opposite side of the arm B, and has its forward end connected to the sleeve o^2 on the needle-bar, between two collars $o^3 o^3$. The lever o is given proper vibratory motions by suitable cam-connections, and thereby the needle-bar has the

requisite vertically-reciprocating motions in an unvarying plane given to it, in addition to the above-mentioned rotary ones. The needle-bar has a needle having an eye in which is a side opening secured therein to one side of the axis of the needle-bar, so that after the needle has been down through the fabric and the eye of the button and has risen up, drawing a loop of thread, and is rotated, as above described, the point of the needle is thereby carried over a place on the fabric outside of the button-eye, and then goes down through the fabric again, drawing said loop over the button-eye, and the shuttle then carries a thread through said loop. In this way several of said loops are made through and over the button-eye and locked under the fabric, thereby securing the button firmly to the latter.

Suitable take-up and loop-retaining devices, as set forth at length in the above-mentioned application, are provided in this machine to co-operate with said needle-bar, needle, and shuttle in forming said stitch.

A feed-arm, *f*, having attached to the end thereof a feed-tongue, *g*, extending horizontally over the cloth-plate *e*, has imparted to it by suitable devices vibratory and endwise reciprocating motions. When the aforesaid stitch is formed through the button-eye, the thread is carried, when the needle changes position as above described, across said tongue *g*, and after the stitch is completed the arm *f* moves endwise, drawing along the material on the cloth-plate to space the stitches, and by the vibratory movement of the arm *f* the tongue then is moved laterally out of the stitch, the arm immediately moving forward again and swinging to carry the tongue again into position to have another stitch formed across it, as before. The upper end of the aforesaid button-trough 68 and the hopper 50 are secured on the upper part of a frame, C, which has a pivotal connection at 70, Fig. 1, with a part of the frame A, and it is also pivotally connected with the presser-bar lever 15 at 71. Said frame C, from said pivot-point 71, extends downward, as shown, and has formed on its lower end the tubular button-carrier socket S, Figs. 2 and 3. The curved lower end of the trough 68 is given a spiral form, as shown, and is secured to frame C at the end of said socket S, as in Fig. 1. The requisite intermittent rotary motion is given to the aforesaid bottom of the button-hopper 50 by the vibratory lever 53, which is connected with a crank-pin on the gear-wheel 55 by the rod 54. A shaft, F, is hung in suitable bearings on the frame C, having on its rear end the crank-arm E, which engages with the grooved cam 57 on shaft *b*³, whereby said shaft is given a rocking motion. A button-carrier, 58, of tubular form, having the turned-up finger 61 thereon and the annularly-grooved head 62, is fitted to have reciprocating endwise and rotary motions in said socket S, the latter having a spiral groove, 60, therein, in which a pin, 59, in said carrier engages. A button-plunger, 63,

is fitted into said carrier, whose front end is concaved to adapt it somewhat to the form of a button, 69, and near its rear end a slot, 64, is formed through it. A spring, 80, is placed at the rear end of the plunger 63, the screw 65 in the end of the carrier holding said spring within the latter. A vibratory lever, 66, is pivoted on the carrier 58, as shown, one end of which enters said slot in the plunger, and the other extends upward and is adapted to engage with the hooked end of the adjustable lever-stop 67, which is secured to the frame C by screws passing through oblong holes in said stop. By adjusting the stop 67 relative to lever 66 the plunger 63 is caused to be retired more or less from finger 61, to provide for receiving buttons of different sizes. An arm, H, on the rock-shaft F has a bifurcated end, which engages with said annular groove in the button-carrier head 62.

The operation of the above-described button-feeding devices in conveying buttons one by one to the fabric near the needle *i*, and holding them in proper position while they are sewed onto the latter, is as follows: The buttons move down through 68 from the hopper 50, with their shanks hanging downward, as described in said patent, and as they approach the end of the trough they are, by the said spiral turn in the latter, turned to the position shown in Fig. 2. When the carrier is to take a button, it is, by the action of the rock-shaft F and arm H, drawn back, as in Fig. 2, bringing the finger 61 under the end of the trough and letting a button fall between its end and the end of the plunger 63, the loop forming the shank of the button now being in a vertical plane. The lever 66, when the carrier is in said position, has its upper end forced against the end of the stop 67, thereby causing its lower end to act on plunger 63 and draw it back far enough from finger 61 to let a button drop in, as aforesaid, meanwhile compressing the spring 80 at the end of the plunger. The carrier next moves toward the needle *i*, turning as it moves, by the engagement of pin 59 with the spiral slot 60, until the button having the loop which constitutes its eye now in a horizontal plane is carried and held over the fabric under the needle, the latter immediately going down through the eye of the button and acting, as aforesaid, to stitch it to the fabric, after which the above-mentioned feed-tongue moves the fabric along, drawing the button from the carrier. The latter, while in a forward position, lies under and closes the end of the trough and prevents the exit of buttons therefrom. The carrier then retires to the position shown in Fig. 2, lever 66 striking the stop 67 and drawing the plunger away from finger 61, and the above-described operations are repeated.

The purpose served by pivotally attaching the frame C to the presser-bar lever 15 is to impart to the end of the trough and the button-carrier devices coincident movement with the presser-foot, in order that the fabric may

not be borne upon by said devices and the feed movement thereof be interfered with.

The reciprocating movements of the button-carrier 58 are timed to said vertical and rotary movements of the needle-bar as follows: Having sewed on a button, the needle rises to its highest point, and as soon as the latter is clear from the button the material is moved along on the cloth-plate by said feeding devices to space the buttons, carrying the button away from the button-carrier, and immediately the carrier moves back to take another button. After the needle moves up, as just stated, it is carried down through the eye of another button (which has meanwhile been brought forward) and the material, to again draw up the thread in loop form. The needle-bar then partially rotates, carrying the point of the needle to a position over the fabric outside the button-shank, drawing the said loop over the latter, and then the needle again goes down through the fabric, drawing the loop with it for the shuttle to pass through, as clearly set forth in the said application, and said operations are repeated while the button remains there, making a complete stitch of four threads over the button-shank, after which the feeding of the material again takes place, and by repeating said operations another button is sewed on in like manner.

What we claim as our invention is—

1. In a machine for stitching buttons to fabric or other material, a button-reservoir and a trough conveying buttons therefrom, substantially as described, a button-carrier, substantially as described, having reciprocating longitudinal and rotary motions under the end of said button-trough, whereby the button receiving and holding devices of said carrier are moved from under the end of the said trough laterally beyond the latter, conveying a button to a position over the cloth-plate of the machine and under the end of the needle-bar thereof, combined with a needle-bar having longitudinally-reciprocating motions in an unvarying plane and reciprocating rotary mo-

tions, a needle secured in said needle-bar to one side of the axis of the latter, a shuttle, and suitable feeding mechanism, substantially as described, all as set forth.

2. The combination, in a machine for stitching buttons to fabric or other material, of a needle-bar having longitudinal and rotary reciprocating motions, a needle secured in said bar to one side of the axis thereof, suitable stitch-forming devices, substantially as described, co-operating with said needle to form stitches through the said material and the button-shank, and button-feeding mechanism, substantially as described, conveying buttons, one by one, from a reservoir to the required position on the fabric under said needle, substantially as set forth.

3. The combination, with the presser-bar lever, the presser-bar, and the presser-foot, of the frame C, having a pivotal connection with the frame of the machine and with said lever, and the button-reservoir, the button-trough, and the button-carrier attached to said frame, substantially as set forth.

4. In combination, the tubular button-carrier having a finger, 61, at its front end, a pin, 59, fixed therein, the annular grooved head 62, a driving-lever, H, engaging the same, the button-plunger having a reciprocating end-wise movement in said carrier, and having a transverse slot near its rear end, a spring in the carrier at the rear end of the plunger, a lever pivoted on the carrier, and having one end engaging with said slot in the plunger, a stop-bar secured adjustably on frame C, and engaging with one end of said lever, the socket S on said frame having a spiral groove therein, and means, substantially as described, for imparting a longitudinally-reciprocating motion to said carrier, substantially as set forth.

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