

C. M. HORTON.
 BUTTON SEWING MACHINE.
 APPLICATION FILED MAY 7, 1909.

1,020,949.

Patented Mar. 19, 1912.

2 SHEETS—SHEET 1.

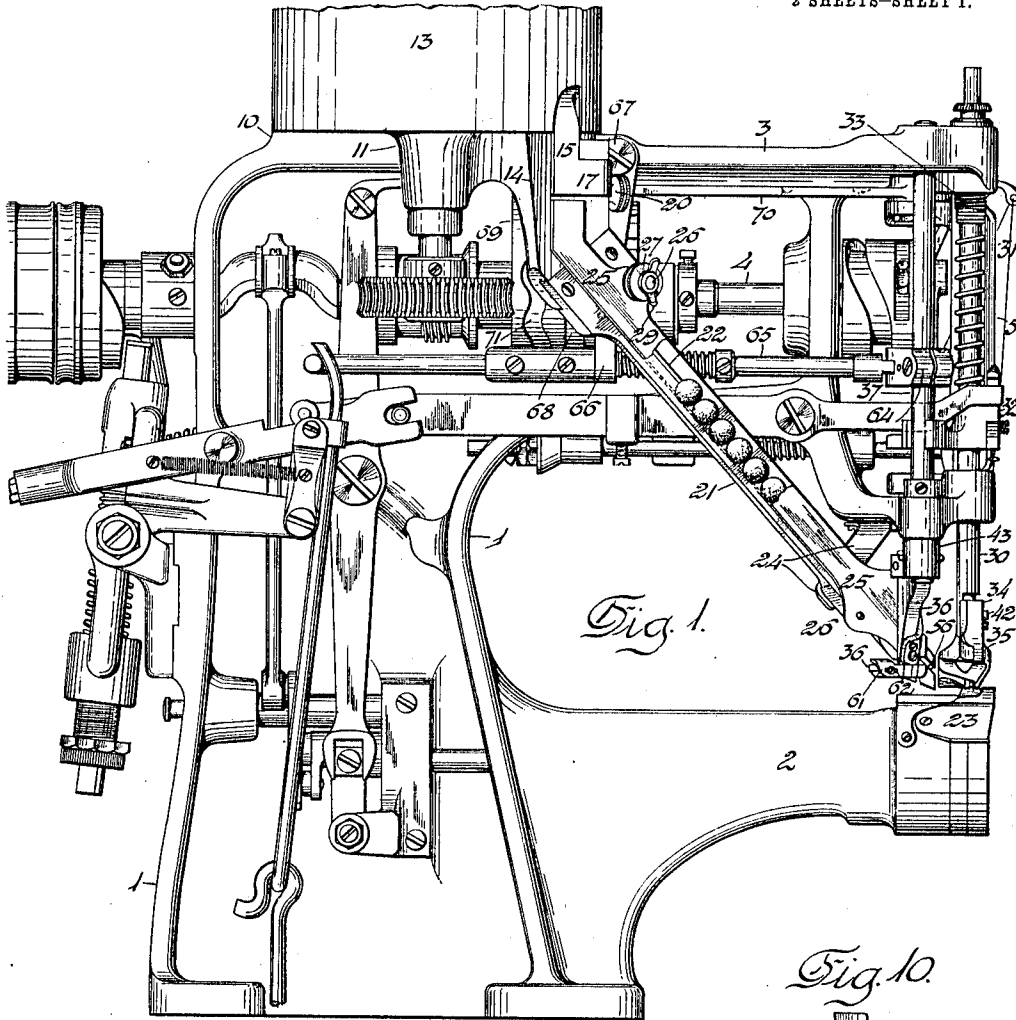


Fig. 1.

Fig. 10.

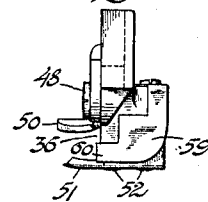


Fig. 8.

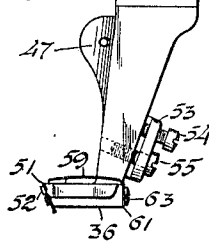
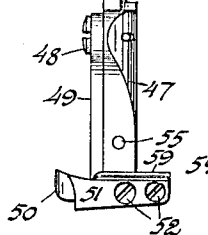


Fig. 9.



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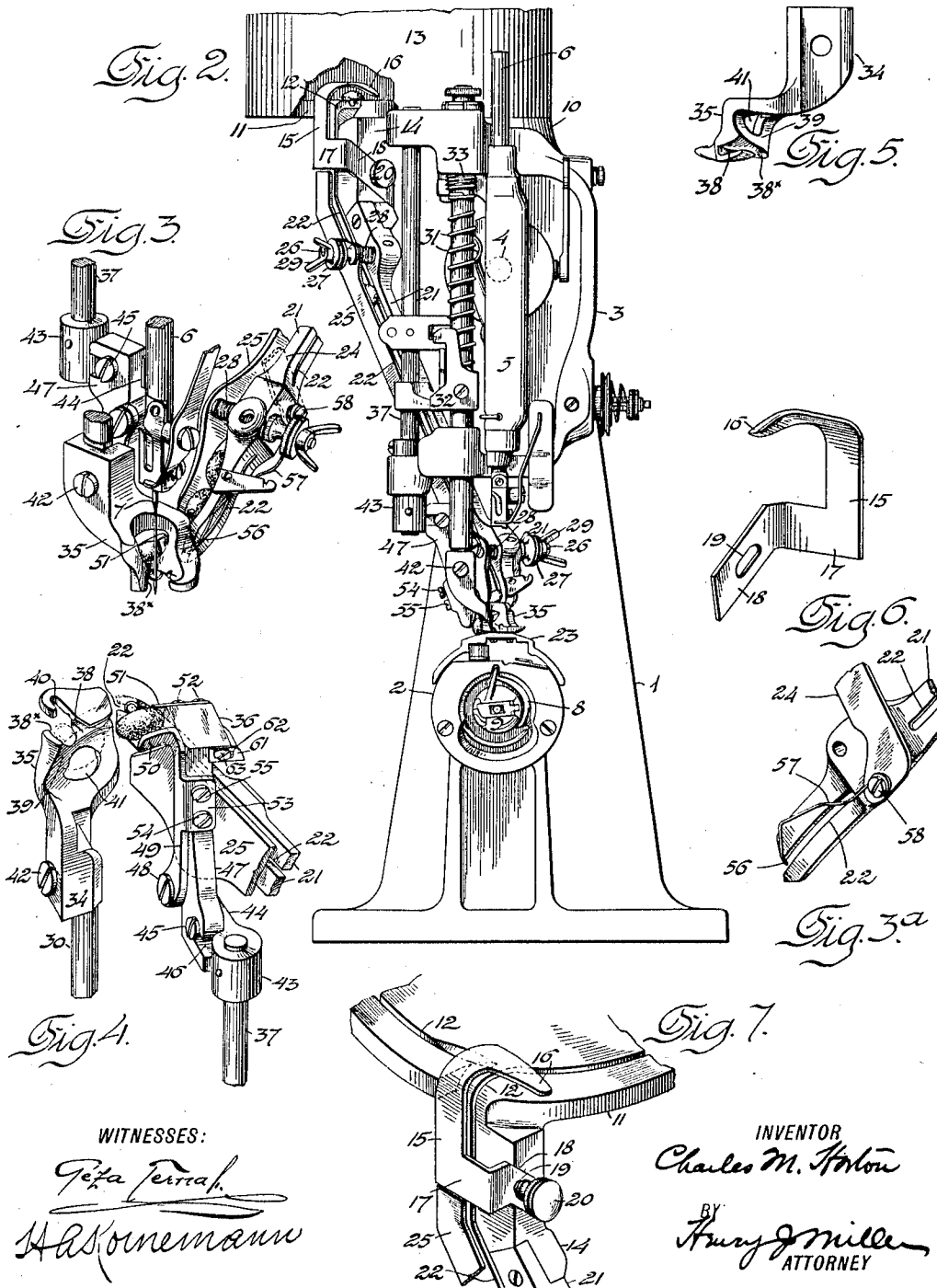
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2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

CHARLES M. HORTON, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BUTTON-SEWING MACHINE.

1,020,949.

Specification of Letters Patent.

Patented Mar. 19, 1912.

Application filed May 7, 1909. Serial No. 494,584.

To all whom it may concern:

Be it known that I, CHARLES M. HORTON, 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 Button-Sewing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more particularly to improvements in the well-known Singer button sewing machine forming the subject of the United States Patents No. 596,020, December 21, 1897, No. 600,297, March 8, 1898, and No. 652,378, June 26, 1900; and it has for its primary object to facilitate the presentation of shank buttons to the stitch-forming mechanism by which they are attached to the fabric, and to increase the certainty of their manipulation preparatory to each button fastening operation.

In its preferred embodiment, the button feeding mechanism comprises a hopper intermediate which and the stitch-forming mechanism is a downwardly inclined button-chute provided with a button-shank guiding slot or raceway and an adjacent button-head guiding raceway one side of which is laterally adjustable in relation to the other to accommodate buttons having heads of different thicknesses. The lower end of the chute is cut away upon one side to afford a lateral notch in the button-head guiding raceway adapted to be entered by the horizontally moving button-pusher or feeding member; and the presser-foot, constituting a holding member for the button, is formed with continuations of the button-shank and button-head guiding raceways, one side of the latter being omitted to accommodate the pusher or feeder, which latter is formed in its front side with a laterally closed button-head receiving recess having a button-shank engaging member which is adapted to enter the button-head raceway of the chute and the presser-foot for engagement with the button-shank which latter is thus carried into stitching position. The button-pusher or feeder is mounted upon a rock-shaft rearward of the lower end of the button-chute, and its operative or button-engaging portion moves in a comparatively long circular arc extending horizontally across the lower end of the button-chute and through the presser-foot, so that the button-head as-

sumes stitching position in substantial parallelism with the position in which it leaves the lower end of the chute, thus insuring the direct transfer of the button from the chute to the button-holding portion of the presser-foot with the simplest possible manipulation.

The substantially vertical upper end of the chute is formed with a separable cap-piece having a curved finger entering an aperture in the side wall of the hopper slightly above its bottom, said cap-piece being provided with an inclined shank fitted to a similarly inclined rigid seat upon which it is adjustably secured to vary the width of the button-head channel at the mouth of the hopper to accommodate buttons of different sizes.

The invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a rear side elevation of a button sewing machine embodying the present improvements, and Fig. 2 a front end view of the same. Figs. 3, 3^a and 4 are perspective views representing the button-handling means at the stitching point. Fig. 5 is a perspective view of the presser-foot. Figs. 6 and 7 are perspective views, respectively, of the button-chute cap-plate and upper end of the button-chute and the adjacent portion of the button-hopper. Figs. 8, 9 and 10 are detail views of the button-pusher or carrier.

The button sewing machine shown in the drawings is constructed with a frame comprising the usual standard 1 with work-supporting arm 2 and overhanging bracket-arm 3 in which is journaled the main-shaft 4. In the head of the bracket-arm is mounted the swinging needle-frame 5 in which is journaled the vertically reciprocating needle bar 6 carrying the needle 7 coöperating with the oscillating shuttle 8 with thread-case 9 in the production of button-fastening over-seam stitches. The top of the bracket-arm is formed at its rearward end with a boss 10 affording a seat for the base 11 of the button-hopper, which is of the general construction represented in the United States Patent No. 596,020, before mentioned, the bottom of the hopper being slotted to form a run-way 12 for the button-shanks and being embraced by the cylindrical casing 13 for inclosing the buttons. Depending from

the hopper base 11 adjacent the mouth of the hopper is a bracket-piece 14 containing in its face a continuation of the run-way 12 of the hopper and constituting the upper end of the button-shank raceway of the chute, and also one side of the button-head raceway whose other side is afforded by the cap-piece 15 having at its upper end the curved finger 16 conforming substantially with the curvature of the button run-way upon the bottom of the hopper as it enters the upper end of the chute thus provided. The lower end of the cap-plate 15 is formed with a lateral arm 17 having a downwardly and forwardly inclined shank 18 provided with a similarly extending slot 19 entered by the clamp-screw 20 which is tapped into the bottom of an inclined seat cut in the edge of the bracket-piece 14, by which the cap-piece is secured adjustably in an oblique direction with relation to the upper portion of the button-chute.

The body of the button-chute comprises a downwardly inclined bar 21 having in its rearward face a longitudinal slot 22 forming a continuation of the button-shank slot of the bracket-piece 14, said bar extending downwardly to a point near the arched throat-plate 23 of the work-supporting arm 2 and adjacent the path of movement of the needle 7, and being secured near its lower end by means of the rigid arm 24 to the lower end of the head of the bracket-arm 3 of the machine. The face of the bar 21 upon opposite sides of the button-shank slot or raceway 22 affords a seat to receive the lower sides of the button-heads, which are confined thereon by means of the plate 25 adjustably secured in suitably spaced relation with the bar 21 by means of the screws 26 with adjusting nuts 27 acting in opposition to the interposed springs 28 and secured from turning by means of the jam-nuts 29.

Attached to the lower end of the presser-bar 30 which is journaled in the head of the bracket-arm 3, and normally pressed downwardly by means of the spring 31 interposed between the fixed lifting collar 32 and the adjustable bushing 33, is the shank 34 of the presser-foot 35 serving in conjunction with the button-pusher or feeder 36 carried by the rock-shaft 37 in holding the buttons in stitching position. The presser-foot 35 is formed in its lower portion with a lateral button-shank slot 38 and the adjacent button-head guideway 39 which are arranged continuously with the corresponding button-guiding portions of the lower end of the button-chute, and are, similarly to the latter, arranged in an arc concentric with the button-feeder rock-shaft 37. The presser-foot is further provided with the usual needle-slot 40 disposed transversely of the button-head guideway, and is

cut out adjacent the same to form an inspection aperture 41 opening into the top of the button-head guideway, the shank of the foot being secured upon the lower end of the presser-bar 30 by means of the usual fastening screw 42. The fabric-engaging portion of the presser-foot is that part beneath the button-shank guide-slot 38 and partially surrounding the needle-slot 40, although the upper side of the button-head guideway serves to press the button-head downward upon the fabric for a like purpose.

The pusher rock-shaft 37 has fixed upon its lower end a collar 43 having a lateral arm 44 to which the button-feeder is fastened by means of the screw 45 entering a lateral slot 46 of the shank 47 of the feeder. Upon a fulcrum-screw 48 tapped into the shank 47 of the feeder is mounted at the forward side of the shank the depending arm 49 provided with an outwardly turned finger 50 which affords one side of a button receiving recess, whose other side is afforded by the flat pusher-plate 51 secured to the edge of the feeder-foot 36 by means of screws 52. To accommodate different sizes of button-heads, the shanks for different sized buttons being in practice substantially uniform in size, the arm 49 is formed with a backwardly projecting lug 53 through which is tapped the set-screw 54 whose point is adapted to rest upon the rearward edge of the feeder-shank 47, while a second adjusting screw 55 passes through a second aperture in said lug and is tapped into the feeder-shank. By loosening the set-screw 54 and turning the adjusting screw 55 to adjust the spacing of the finger 50 from the pusher-plate 51, and retightening the set-screw 54, the feeder is adjusted for different sizes of buttons. Adjustments for such variations in thickness of the button-heads is similarly effected in the chute by shifting the positions of the cap-piece 15 and the button-head race cover-plate 25 as previously indicated. The depth of the button-head raceway in the chute is so adjusted as to confine the button-heads loosely therein to enable the buttons to gravitate freely from the hopper to the lower end of the chute, where they are arrested by engagement of the shank of the foremost button with a yielding stop-finger 56 at the free end of the wire-spring 57 secured by means of the fastening screw 58 upon the lower portion of the button-guiding bar 21. Upon the top of the feeder-foot 36 is secured a button-head stop-plate 59 having a button-engaging portion 60 slightly overhanging the rearward end of the button-receiving recess of the feeder, and provided with an angularly disposed flange 61 formed with a slot 62 entered by the fastening screw 63 by which it is adjustably secured to the feeder-foot 36 in such manner as to vary

its projection over the rearward edge of the button-receiving recess of the feeder. As the feeder moves forwardly from retracted position toward stitching or fastening position, its engagement with the shank of the foremost button forces the latter forward, thus thrusting aside the yielding stop-finger 56, which would permit the succeeding button to gravitate downwardly, were it not for the initial portion 60 of the stop-plate 59, which serves to engage the head of the succeeding button and support the same until the completion of a fastening operation and the retraction of the feeder to initial position, when the head of the button so supported is released, and the button allowed to descend until its shank engages the stop-pin 56, when the button is again arrested, to be disengaged only by the forcible action of the pusher-plate 51 upon said shank in opposition to the yielding stop-pin.

In the Singer button sewing machine before mentioned, the button raceway formed in the presser-foot is so arranged that under the combined action of the same and the pusher or feeding member the button head is turned around at right angles to the position in which it leaves the lower end of the chute, and assumes a position parallel with the direction of lateral or jogging movement of the needle for the fastening operation. According to the present improvement, the button-shank and button-head raceways of the presser-foot are not only in register at the adjacent side of the foot with the corresponding raceways of the button-chute, but are disposed in a circular arc concentric with the feeder rock-shaft 37, and in substantially the same transverse relation to the plane of lateral movements of the needle as such corresponding raceways in the button-chute. As the travel of the button between the lower end of the chute and fastening position within the presser-foot is short in comparison with the radius of such slightly circular movement, it will be observed that the button arrives in fastening position in substantially the same angular relation to the plane of lateral needle movements as it occupied in the lower end of the chute preparatory to its delivery to the presser-foot.

For convenience in construction of the machine, the feeder rock-shaft 37 is arranged parallel with the presser-bar and needle-bar, so that the path of circular movement of the feeder 36 mounted thereon is in a horizontal plane substantially parallel with the top of the work-support, herein shown as the throat-plate 23; but the button-shank slots or raceways in the lower portion of the chute and in the presser-foot are downwardly inclined, so as to direct the button to a stitching position closely adjacent to the bottom or work-engaging face of

the presser-foot. It will therefore be observed that the button-shanks have a slight vertical movement along the forward or operative edge of the pusher-plate 51 in the travel from the lower end of the chute to fastening position, for which reason the pusher-plate is formed, as represented in the drawings, with a backwardly inclined and slight curved forward edge so as to assist in advancing the button and preventing the jamming of the shank within the guiding raceway, the inclination of its operative edge being substantially at right angles to that of the different portions of the button-shank raceways of the chute and the presser-foot.

As will be observed by reference, more particularly to Fig. 1, the feeder rock-shaft 37 has fixed thereon a forwardly projecting crank-arm 64 to which is pivotally connected one end of a thrust-rod 65 yieldingly connected with the lower end of an actuating lever 66 fulcrumed at 67 and actuated by a suitable connection with the cam-groove 68 of the cam-cylinder 69, as shown more fully in the Patent No. 596,020, before mentioned.

At the completion of each button-fastening operation, the feeder 36 is retracted to enable the operative portion 60 of its stop-plate 59 to release the head of the lowermost button within the chute and permit the same to drop by gravity in front of the feeder recess or cavity, in which position it is arrested by the yielding stop-pin 56. After the production of one or more initial fastening stitches, the feeder advances through the notch in the lower portion of the chute, and the engagement of the pusher-plate 51 with the shank of the button adjacent the head, which latter is embraced by the button-cavity of the feeder, causes the button to advance, thrusting aside the spring stop-pin 56, as it advances into operative or fastening position with the forward edge of the shank in contact with the stop-shoulder 38* of the presser-foot in register with the rearward end of the needle-slot, while the button-head assumes a position beneath the inspection aperture 41 with its under side set against the button-head raceway 39 of the presser-foot. The descent of the needle alternately through and outside of the button-shank in the succeeding fastening operation serves to firmly secure the button to the fabric. At the completion of the fastening operation, the feeder whose button-head confining finger 50 has thus far formed the rear wall of the button-head raceway in the presser-foot, is retracted to initial inoperative position, and the button-head entirely released from the holding devices, so that the shifting of the material rearwardly in the stitching line permits the movement therewith of the button from the presser-

foot for a succeeding button-attaching operation or the removal of the work from the machine.

As will be observed by reference to the drawings, the button-head confining plate or finger 50 extends somewhat in advance of the operative edge of the pusher-plate 51, which latter extends a little short of the center of the button in order to engage one side of the shank in transferring the same from the lower end of the chute to fastening position within the foot, while the confining plate or finger 50 projects somewhat beyond the center of the button-head so as to insure the proper holding of the same against its seat within the foot for the fastening operation.

As in the United States Patent No. 596,020, before mentioned, the jogging mechanism for the needle-frame comprises the link-bar 70 pivotally connected at its forward end to the swinging frame 5 and suitably connected at the rearward end beneath the hopper 13 with the sinuous cam-groove 71 of the cam-cylinder 69.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a button-fastening machine, the combination with button-fastening devices, a button-hopper, and means for supporting and guiding the buttons in their travel from the hopper to fastening position, of a button-feeder having a button-shank engaging member movable relatively to said button-supporting and guiding means and having upon one extremity a shoulder adapted for engagement with a button-shank for propulsion of the button into fastening position.

2. In a button-fastening machine, the combination with button-fastening devices, a button-hopper, and means for supporting and guiding the buttons in their travel from the hopper to fastening position, of a button-feeder having a button-shank engaging member movable relatively to said button-supporting and guiding means and having upon one extremity a shoulder adapted for engagement with a button-shank for propulsion of the button into fastening position, and actuating means whereby said button-feeder is operated to feed the button into fastening position and is thereafter disengaged from the button before the end of each cycle of operation of the machine and subsequent to the beginning of a button-fastening operation.

3. In a button-fastening machine, the combination with button-fastening devices, a button-hopper, and means for supporting and guiding the buttons in their travel from the hopper to fastening position, of a button-feeder having a button-shank engaging member movable relatively to said button-supporting and guiding means and having upon one extremity a shoulder adapted for

engagement with a button-shank for propulsion of the button into fastening position, and actuating means acting automatically in each cycle of operation of the machine for successively operating the feeder to propel the button into fastening position before the action of the fastening means and to retract the feeder from engagement with the button after the beginning of the button-fastening action.

4. In a button feeding mechanism, the combination with a button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway and having a lateral notch extending into the button head guiding raceway and transversely to the button-shank guiding raceway, of a feeder provided with a button-head receiving recess open at one side and a laterally disposed button-shank engaging member adapted to enter the button-head raceway through said notch for engagement with the shank of a button within said chute.

5. In a button feeding mechanism, the combination with the button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway, and having a lateral notch extending into the button head guiding raceway, of a button-holding member formed with button-shank and button-head guiding raceways in register with the adjacent portions of the corresponding raceways of the button-chute, a button-feeder provided with a laterally closed button-head receiving recess and with a button-shank engaging member adapted to enter the button-head raceway of the chute through said notch for engagement with the button-shank and to move into the button-head raceway of the holder for transferring the button-shank into button fastening position in the latter, and means for actuating said button-feeder.

6. In a button-feeding mechanism, the combination with a button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway and formed at its delivery end with a lateral aperture leading into the button-head guiding raceway, of a button-holding member formed with button-shank and button-head guiding raceways in register with the adjacent portions of the corresponding raceways of the button-chute, a button-feeder provided with a button-head receiving recess with relatively adjustable side walls for accommodating different sized button-heads and with a button-shank engaging member adapted to enter the button-head raceway of the chute through said lateral aperture for engagement with the button-shank and to move into the button-head raceway of the holder for transferring the button-shank into button-fastening position

in the latter, and means for actuating said button-feeder.

7. In a button-feeding mechanism, the combination with a button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway and formed at its delivery end with a lateral aperture leading into the button-head guiding raceway, of a button-holding member formed with button-shank and button-head guiding raceways in register with the adjacent portions of the corresponding raceways of the button-chute, a yielding button-shank stop normally disposed within the button-shank raceway of the button-chute, a button-feeder provided with a button-head receiving recess and with a button-shank engaging member adapted to enter the button-head raceway of the chute through said lateral aperture for engagement with the button-shank and to move into the button-head raceway of the holder for transferring the button-shank into button fastening position in the latter, a button-head stop carried by said button-feeder and adapted to support the button succeeding that whose shank is engaged by said feeder, and means for actuating said button-feeder.

8. In a button-feeding mechanism, the combination with the button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway and formed at its delivery end with a lateral aperture leading into the button-head guiding raceway, of a button-holding member formed with button-shank and button-head guiding raceways in register with the adjacent portions of the corresponding raceways of the button-chute, a yielding button-shank stop normally disposed within the button-shank raceway of the button-chute, a button-feeder provided with a button head receiving recess and with a button-shank engaging member adapted to enter the button-head raceway of the chute through said lateral aperture for engagement with the button-shank and to move into the button-head raceway of the holder or transferring the button-shank into button-fastening position in the latter, a button-head stop adjustably mounted upon said button-feeder and adapted to support the button succeeding that whose shank is engaged by said feeder, and means for actuating said button-feeder.

9. In a shank-button fastening machine, the combination with a presser-foot provided with a slot to receive the button-fastening means and with substantially straight button-head and button-shank guiding raceways disposed transversely of said slot and substantially parallel with the operative face of the presser-foot, of a button-hopper, a chute formed with button-head and button-shank raceways leading from said hopper to the presser-foot and having its

raceways in register with the corresponding raceways of the presser-foot, a button-feeder comprising a button-engaging member for transferring the buttons from the chute into the fastening position in the presser-foot, and means for fastening the buttons to the fabric.

10. In a shank-button fastening machine, the combination with the work-support and a presser-foot provided with substantially straight button-head and button-shank guiding raceways, the latter being inclined downwardly toward said work-support, of a button-hopper, a chute formed with button-head and button-shank raceways leading from said hopper to the presser-foot and having its raceways in register with the corresponding raceways of the presser-foot and formed with a lateral aperture in the button-head raceway adjacent said presser-foot, a button-feeder comprising a button-engaging member having its operative edge inclined in substantially right-angular relation to the adjacent portion of the button-shank raceway and adapted to enter said aperture in the chute for transferring buttons from the latter into fastening position in the presser-foot, means for imparting operative movements to said feeder in a plane parallel with the work-support, and means for fastening the buttons to the fabric.

11. In a shank-button fastening machine, the combination with overseaming stitch-forming mechanism including a reciprocating and laterally jogging needle, a work-support, a presser-foot provided with substantially straight button-head and button-shank guiding raceways disposed transversely of the direction of jogging movement of said needle and substantially parallel with the operative face of the presser-foot, of a button-hopper, a chute formed with button-head and button-shank raceways leading from said hopper to the presser-foot and having its raceways in register with the corresponding raceways of the presser-foot, a button-feeder comprising a button-engaging member for transferring the buttons from the chute into fastening position in the presser-foot, and means for actuating said button-feeder.

12. In a shank-button fastening machine, the combination with a presser-foot provided with button-head and button-shank guiding raceways, of a button-hopper formed with a lateral outlet and having in its bottom a button-shank runway leading outwardly through said outlet, a chute formed with button-head and button-shank raceways and adapted to convey buttons from said hopper to the presser-foot, a cap-piece for the upper end of said chute having a finger extending through said outlet into the hopper and above the bottom of the same, said cap-piece being provided with a

shank inclined to the bottom of said hopper and the adjacent portion of the chute, means applied to the shank of said cap-piece for securing the same in position adjustably 5 obliquely to the bottom of the hopper and adjacent portion of the chute, means for transferring buttons successively from said chute to button-fastening position within the presser-foot, and means for fastening 10 the buttons to the fabric.

13. In a button-feeding mechanism, the combination with a button-chute provided with a button-shank guiding raceway and an adjacent button-head guiding raceway, 15 of a button-shank engaging member movable in a path of movement at an inclination to said chute and wholly at one side of the button-head guiding raceway adjacent the button-shank raceway, and means for actu- 20 ating said button-shank engaging member.

14. In a button-feeding mechanism, the combination with a button-chute provided

with a button-shank guiding raceway and an adjacent button-head guiding raceway, of detaining means normally engaging a 25 button-shank within said raceway and movable transversely of the latter, a button-shank engaging member independent of said detaining means and movable in a path at an inclination to said chute and wholly 30 at one side of the button-head guiding raceway adjacent the button-shank raceway, and means for actuating said button-shank engaging member to advance the same from the detaining means for presentation to 35 button-fastening devices.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES M. HORTON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."