

May 27, 1952

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2,597,912

SHANK BUTTON FEEDER FOR BUTTON SEWING MACHINES

Filed Oct. 4, 1948

3 Sheets-Sheet 1

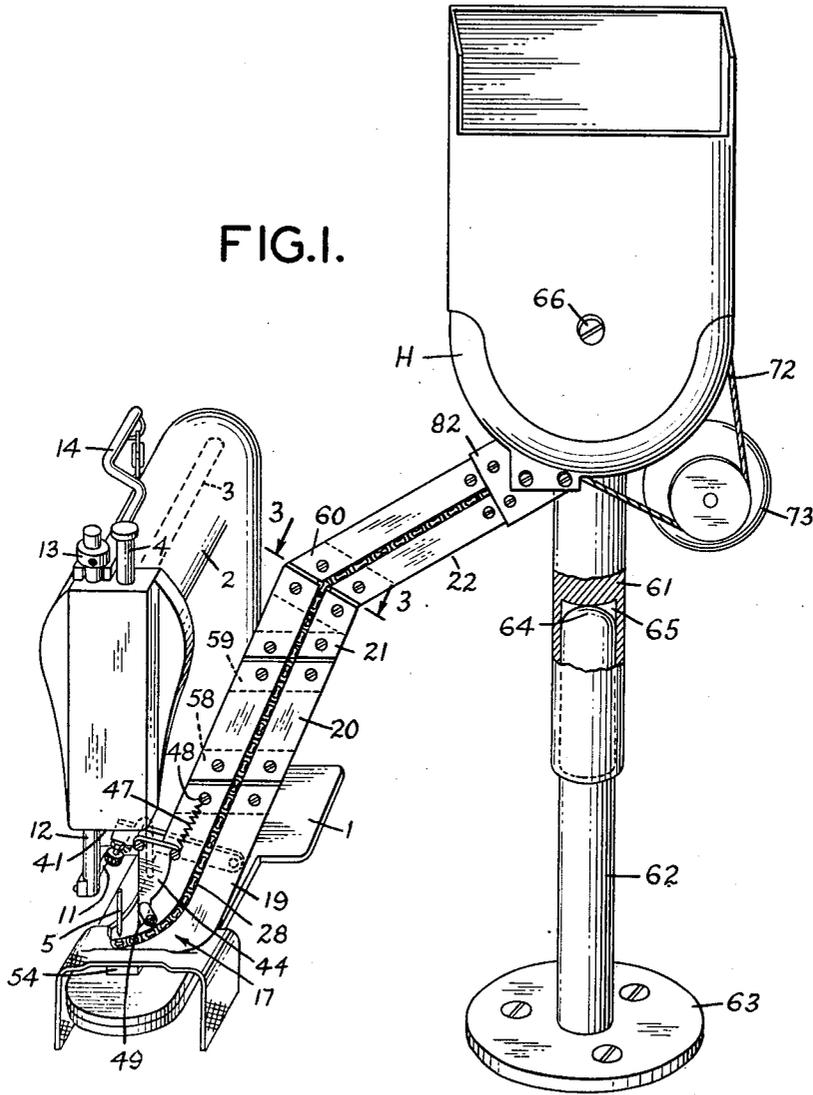


FIG. 2.

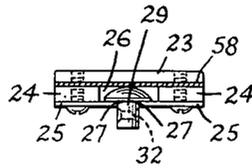
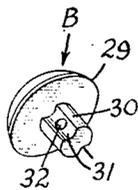


FIG. 3.

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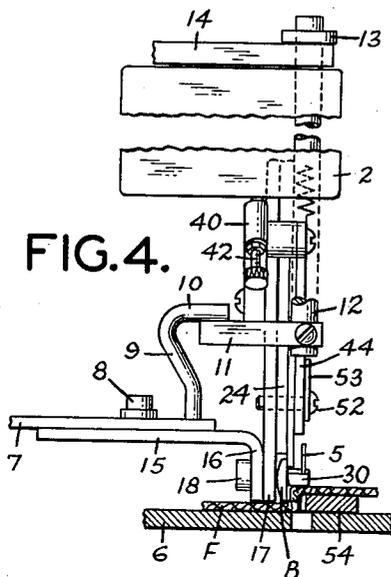


FIG. 4.

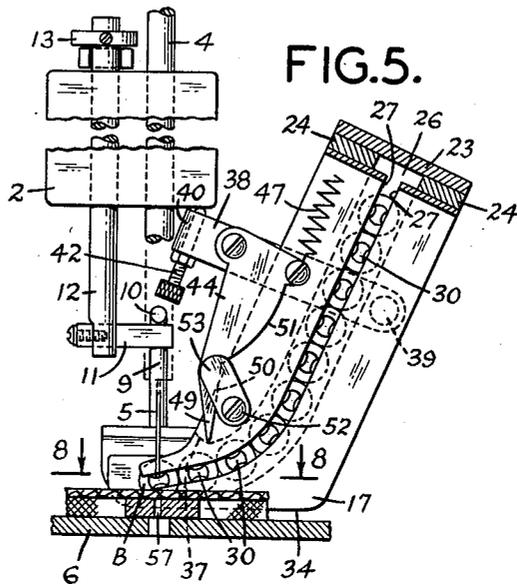


FIG. 5.

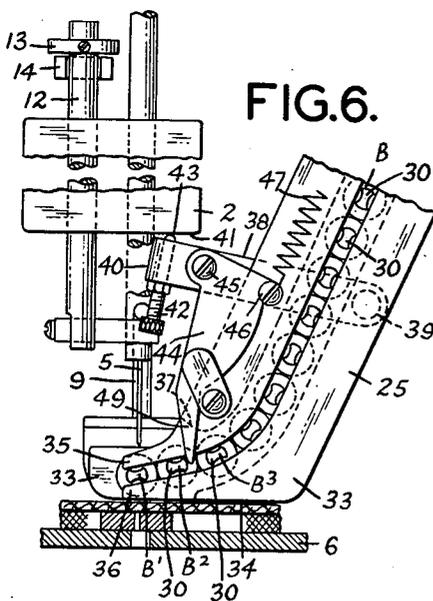


FIG. 6.

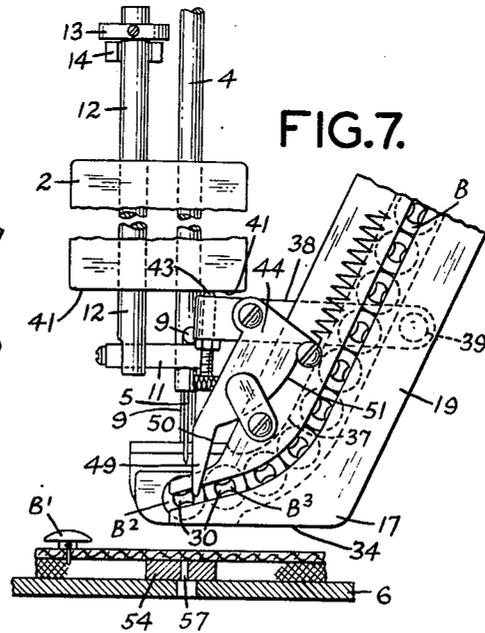


FIG. 7.

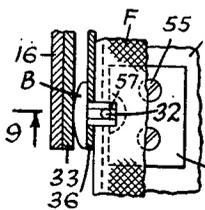


FIG. 8.

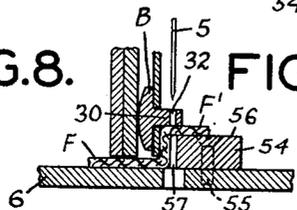


FIG. 9.

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FIG. 10.

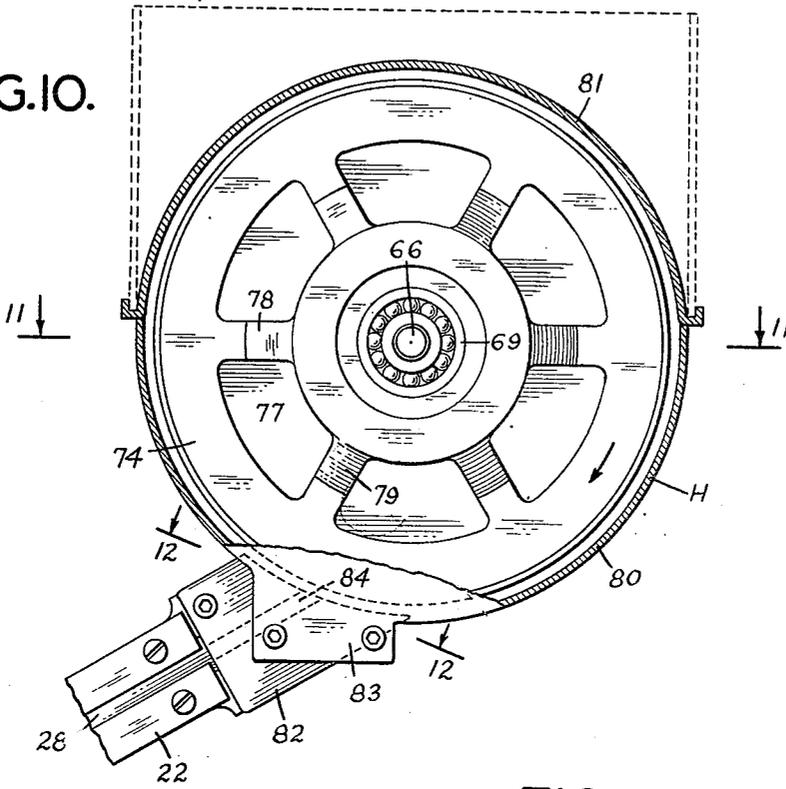


FIG. 11.

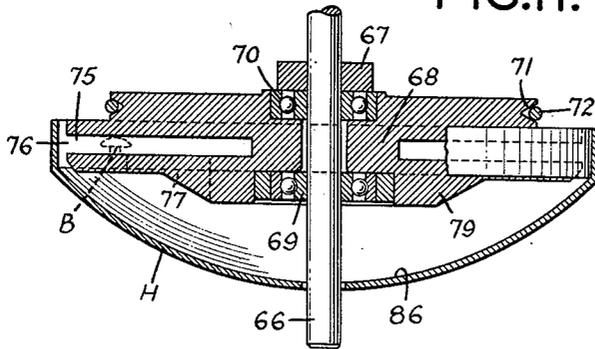
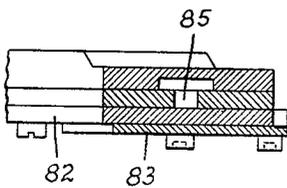


FIG. 12.



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# UNITED STATES PATENT OFFICE

2,597,912

## SHANK BUTTON FEEDER FOR BUTTON SEWING MACHINES

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7 Claims. (Cl. 112—113)

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This invention relates to a button feed assembly; more particularly to a device for automatically feeding buttons to a button sewing machine.

It is an object of my invention to provide a button sewing machine, such as that shown in the United States patent to J. J. Sullivan No. 777,564 of December 13, 1904, and known as a Singer button sewing machine, with an attachment which will convert the work holding clamp to one which may efficiently and automatically feed buttons, properly oriented, in sewing position so that the normal cycle of sewing involving lifting the presser foot to position the work and operating the button sewing mechanism may be performed without the necessity for hand location of the button, the movement of operating the presser foot serving to discharge a sewn button while locating a new button in position on the presser foot, the movement of the presser foot to the work engaging position restoring the mechanism for the next cycle of operation.

Accordingly, it is an object of my invention to provide a combined presser foot, button chute and button feed whereby the button feeding operation for sewing is made positive and expeditiously effected to make automatic the button sewing operation, leaving it merely to the operator to locate the position on the garment where the button is to be affixed.

Still more particularly it is an object of my invention to provide a button feeding mechanism including a novel construction of classifying hopper and chute in combination with the feed to the button sewing machine whereby the operation of button sewing, particularly for shank buttons, may be effected quickly and efficiently and without hand location of the button in the work holding mechanism.

Still more particularly, it is an object of my invention to provide a button feeding mechanism, particularly for shank buttons, which may quickly and efficiently be installed in existing button sewing machines, to require little labor to effect a conversion of the machine from one type of work to another and to provide a low cost and easily maintainable attachment.

To attain these objects and such further objects as may appear herein, or be hereinafter pointed out, I make reference to the accompanying drawing forming a part hereof, in which—

Figure 1 is a perspective view showing my device with portions thereof broken away to disclose details;

Figure 2 is a magnified perspective view of a

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button to be used in the installation illustrated;

Figure 3 is a section taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary plan view taken from the right hand side of the button sewing machine;

Figure 5 is a front view of the machine with the feeding mechanism in a corresponding position;

Figure 6 is a view similar to Figure 5, with the presser foot partially raised;

Figure 7 is a similar view, with the presser foot completely raised;

Figure 8 is a section taken on the line 8—8 of Figure 5;

Figure 9 is a section taken on the line 9—9 of Figure 8;

Figure 10 is a magnified view of the hopper;

Figure 11 is a section taken on the line 11—11 of Figure 10;

Figure 12 is a section taken on the line 12—12 of Figure 10.

Making reference to the drawings, my invention is illustrated in connection with a Singer type of button sewing machine following the general principles of the Sullivan patent above mentioned, in which the machine frame is constructed with the usual bed plate 1 from which rises the overhanging bracket frame 2, having journaled therein a shaft 3, to which is operatively connected the rectilinear reciprocating needle bar 4 carrying the needle 5 which constitutes one member of the stitch forming mechanism. Slidably mounted upon the bed plate is the usual slide bar 6, constituting a carrier for the work holding parts. The slide bar has also cooperatively connected with it the clamp arm 7 and is suitably slotted to receive the screws 8. The clamp arm 7 also carries the post 9, having the usual cross bar 10 for engagement by the rearwardly extending bracket arm 11, mounted on the lift bar 12, and slidably mounted within the head of the bracket arm 2, previously mentioned. The lift bar 12 at its upper end is provided with a collar 13, arranged to be operated by the usual clamp operating rock lever, fulcrumed upon the bracket arm 2, to be operated by the usual foot treadle chain pull 14, before and after the button sewing operation.

The clamp arm 7 is arranged to have attached to it the bracket 15 by means of the screws 8 previously described, and which are screw threaded into the bracket 15. The bracket 15 has a downwardly directed branch 16 which supports the combined chute and presser foot 17

by the screws 18. The presser foot and chute includes a plurality of sections 19, 20, 21 and 22, each having a back plate 23, spacer strips 24, 24 and cover plates 25, 25, outlining a button guide channel 26 and edges 27 of a slot 28, for the shank thereof, conforming generally to the head 29 of the shank button B. The shank 30 has been integrally formed with the head of the button 29 by a moulding operation and is generally cylindrical in outline, with grooved portions 31 to each face thereof, through which the sewing hole 32 is formed by drilling. This contour presents a button shank which has generally predominantly cylindrical sides to each side of the drill hole, and flattened edges to each end of the drill hole, with a groove 31, as described, forming a thread receiving cavity. The shank may be considered as relatively massive as compared with staple shank buttons, and buttons of this construction have a contributing factor to the operation of the feed mechanism herein described.

The section 19 has a transverse branch 33, whose base 34 is angularly directed generally to the section 19. The cover plates 24 follow the general contour of the transverse branch 33 to provide spaced fingers 35 and 36, the upper spacer strip 24 terminating at 37 at a distance to leave the buttons B1 (the first position) and B2 (the second position) under the spring action of the fingers 35 and 36. The fingers 35 and 36 are thinned out for springiness and spaced away from the plate 23 to leave accessible at their exterior sides, the shanks 30 of the buttons, to position the button B to have the sewing hole 32 in the aligned position with the needle 5 by the detent action of the fingers on the button.

With this construction I provide a feed lever 38, one end of which is pivoted at 39 on the rear face of the chute plate 23. The forward end 40 extends beneath the nose 41 of the bracket arm 2. An adjusting screw 42 has its end 43 engaging the nose 41, for purposes which will appear hereafter.

The feed lever 38 carries a swinging pawl 44 pivoted by the threaded pin 45. A side branch 46 thereof is connected to the coiled spring 47, whose opposite end is attached to an anchoring pin 48 to pull the same down. The pawl 44 has a claw finger 49 and camming sides 50 and 51. The action of the spring 47 normally urges the bearing surfaces 50 and 51 against the guide pin 52, suitably provided with anti-friction means. The guide pin 52 also carries the plate 53 in the various positions which the pawl 44 may assume, as will appear hereinbelow.

Normally the presser foot and chute section 36 is adjusted for contact with the plate 6 for the limiting downward position of the clamp arm 7. The presser foot 17 may bear upon the fabric F, pinching the same over the slide bar 6 which carries a block 54, adjustable by screw threaded means 55. The block 54 is of a height with respect to the bearing surface of the presser foot and the shank of the button to press the fold F' on the upper surface 56 of the block. A groove 57 permits the clearance for the needle 5, as will be readily understood. It will be observed, therefore, that the shank 30 of the button serves to hold the fabric pressed upon the block 54, as well as upon the plate 6 in the downward position of the presser foot.

In this position, the adjusting screw 42 tilts the pawl 44 downwardly so that the pawl finger

49 is normally spaced from the path of the buttons which may move within the slot 26 of the chute. With this adjustment made, upon raising the lift bar 12 through the medium of the rock shaft 14, the clamp arm 7 will be raised to lift the presser foot from the position shown in Figures 4 and 5 to that shown in Figure 6. The lever arm 38 is then tilted, directing the prong finger 49 in the space between the second and third buttons B2 and B3, to engage the shank 30 of the button B2. As the presser foot movement continues upwardly, contact of the pawl 44 with the guide pin 52 passes from the camming surface 50 of gradual pushing magnitude to the more abrupt camming magnitude of surface 51, as more clearly illustrated in Figure 7, to move the button B2 from the second position to the first position, and to eject the button B1. Thus, upon reaching the limiting upward position of the presser foot, the button in the position B1 has been ejected, and a new button located in its place. The throw of the lever 38 is adjusted with regard to the throw of the lift bar 12 so that it may move a button through the medium of the shank 30 thereof on the exterior face. The engagement of the shank of the button does not disturb the arrangement of the buttons backing up behind those in the first and second positions, in any way to interfere with the natural gravitational throw or the resistance of the buttons to be backed up or effecting any canting of the buttons.

The operation of feeding the buttons to a sewing position by pushing the shanks of the buttons along the chute rather than the heads, places no restriction on the shape or contour of the contacting edges and of the heads of the buttons with each other.

The chute sections 19, 20, 21 and 22 are articulated with respect to each other by being joined by flexible shims 58, 59 and 60, leaving spaces between these sections sufficient to form a flexible chute which responds to the joggling action of the clamp plate and slide bar 6 with minimum restraint. The section 22 is connected with the hopper H which is mounted upon a tubular bearing 61 having pivotal connection with the standard 62 which is supported on the pedestal 63 attached to the work table. The head 64 of the standard 62 is sleeved in the socket 65 of the tubular bearing 61 to permit freedom of movement of the bearing 61 and standard 62. The hopper H is supported on the shaft 66 mounted on the arm 61, which normally lies approximately horizontally.

The hopper construction now to be described includes mounting upon the shaft 66 a collar 67 against which there is abutted the distributing spider 68 by the anti-friction bearings 69 and 70. The spider on one face has a pulley groove 71 for receiving the belt 72 of the motorized drive member 73, and constitutes a flange 74 defining a slot 75, open at its periphery 76. The slot 75 corresponds generally, with reasonable tolerances, to the thickness of the button from the top of the head to the end of the shank.

The flange 74 includes a plurality of openings 77 formed by the radial arms 78, extending from the hub 79. The assembly thus provided has sleeved thereover the hopper H so that the bottom wall 80 follows the periphery of the spider at the lower end for a distance corresponding substantially to the overhang of the button head with respect to the shank. A shield 81 at the upper portion of the hopper protects the pe-

riphery of the spider for an equal distance, leaving egress to the spider only through the openings 77.

The bottom wall 80 is concentric with the spider for a distance up to a passed-dead center position, at which portion it connects the hopper with the adapter 82 by means of the flange 83. The adapter 82 has its throat 84 conforming to the outline of the shank button by means of a generally T-shaped slot 85 which is aligned with the slot 28 of the chute segment 22.

With this construction, when the device is ready for use, the motor 73 is put into action. The belt 72 is preferably a coiled spring, to offer enough friction to rotate the spider, but likewise to slip thereover should any obstruction occur, as will appear hereafter. The charge of buttons is fed into the hopper mouth and reaches the spider openings 77 through the bulged lateral section 86 to tumble the buttons and distribute the buttons in the slot 75, moving them by a classifying action until they have been oriented to a position where they fall within the throat 85 by the rolling action from the dead center position to the passed-dead center position, at which the throat 85 is located. This action occurs intermittently with the sewing operation, whereby certain desirable attributes are achieved, assuring steady and uniform flow of buttons along the chute sections 19, 20, 21, 22, with the buttons maintained with the heads in the slots 26 and the shanks projecting through the slot 28 and held in oriented position with the sewing hole apertures 32 at right angles to the edges 27.

The gravitational action slides the buttons down the chute up to the point where they encounter the detent gripping fingers 35, 36, locating the sewing aperture 32 in oriented position opposite the needle 5. In this position, the sewing cycle is accomplished. The presser foot is then raised, relatively to draw up the chute and presser foot section 19, directing downwardly the claw finger 49 in the space between the second and third buttons, and engaging the shank 30 of the second button to eject the sewn button as the presser foot is brought up to the maximum distance.

The cylindrical sides of the shank of the button effect a smooth ejecting action without disturbing the position of the row of buttons along the chute up to the hopper. This is a very desirable feature of my invention since a rearwardly directed pressure on the shank buttons in the second and third positions will tend to effect a canting action and obstruct the feed of the button.

The features of my invention whereby the presser foot is directly connected with the jogging movement of the work holder toward the sewing operation, coupled with the articulated action of the chute segments 19, 20, 21, 22 and the free movement of the hopper on the shaft 66 and the standard 62 all contribute to a classification of the buttons along the chute, and a descent without piling or obstruction. The generally cylindrical sides of the button do not interfere with the movement of the buttons across the jointed sections of the chute from one section to another in the groove 26.

Thus the feed of the buttons from the hopper to the presser foot is assured with positiveness by the flexibility of the chute and the free flow induced in gravitating the buttons to the orienting position.

The motorized hopper is likewise activated

into performing its sorting action to locate the buttons. The slip action of the belt 72 automatically takes the sorting hopper out of play should the chute fill up more rapidly than the discharge of buttons by reason of the completion of the sewing operation.

In general, I have provided a hopper which will positively and accurately orient the buttons within the chute and which will combine with the button shifting mechanism to orient the buttons and to position the sewing holes thereof accurately with regard to the reciprocating needle. This, combined with the jogging action which transmits its vibratory effect to the chute and hopper pivoted about the shaft 66 and the standard 62, assures speed and accuracy of the sewing operations.

It is to be understood that while the invention has been illustrated in connection with a button feeder for button sewing machines, this device is equally suitable for feeding buttons to mount the buttons by other than a sewing machine, such as for example, a stapler, to attach the same upon a display card or sales card, for the purpose of supplying buttons to be sold in such mounted condition.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is:

1. In a button sewing machine, a button feeder comprising a presser foot having a channel leading to a chute for guiding a shank button through a slot formed in the chute engaging the button head, to extend the shank through the side of said chute and adjacent the presser foot, and a feeding pawl extending to one side of said chute including camming means directing the same against the button shank extending from the chute, to feed the button in sewing position upon raising of the presser foot.

2. In a button sewing machine, a button feeder comprising a presser foot having a channel extending therefrom into a chute, the contour of which is arranged slidably to hold a shank button engaging the head thereof and to extend the shank thereof outwardly to one side, a feeder pawl, camming means adjacent said side to direct the claw of said pawl between adjacent shanks of the button to move the button oriented to said presser foot.

3. In a button sewing machine, the combination with a presser foot of a chute including articulatedly joined chute sections to direct the chute from a presser foot to a hopper in an angularly twisted direction by the sections so joined to each other, a supporting standard, said hopper having a pivotal connection with said supporting standard to provide upon jogging and movement of the presser foot, a combined yielding movement of the sections about the standard and in respect to each other.

4. In a button sewing machine, a feed therefor having a presser foot, a chute for feeding shank buttons to said presser foot, said chute comprising a plurality of rectilinear channel sections, hinged joints connecting said sections and a motorized hopper connected to said chute whereby, upon jogging of the presser foot in sewing the button, vibratory movement is transmitted to said chute and hopper.

5. In a button feed for a sewing machine, a hopper, a motorized spider operating independently of the sewing machine having a peripherally shielded transverse slot and axially spaced arms defining radiating slots for tumbling and feeding buttons to said first slot and from said hopper,

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and a discharge throat angularly positioned peripherally of said shield and in a passed-dead center position, and a chute connected with said throat.

6. In a button sewing machine for feeding shank buttons to the sewing machine comprising a presser foot having a channel for the head of the shank button and including a slot through which the shank of said button may extend, a pivotal lever on said chute, a pawl on said lever, a camming means on said pawl engaging deflecting means on said chute whereby, upon raising of the presser foot, said pawl will be projected between spaced shanks extending through said channel, said channel cooperating with said button to feed said button oriented with respect to the presser foot.

7. In a button sewing machine, a presser foot, a chute for feeding oriented shank buttons to said presser foot, said chute having a channel for positioning the heads of the buttons edge-

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wise, a portion of said channel being formed to receive the shanks of said buttons extending to the outer face of said channel, a pawl extending adjacent the outer face of said channel and including camming means directing a portion of said pawl adjacent the extended shank and for camming said shank for feeding the same from said presser foot.

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