

July 31, 1923.

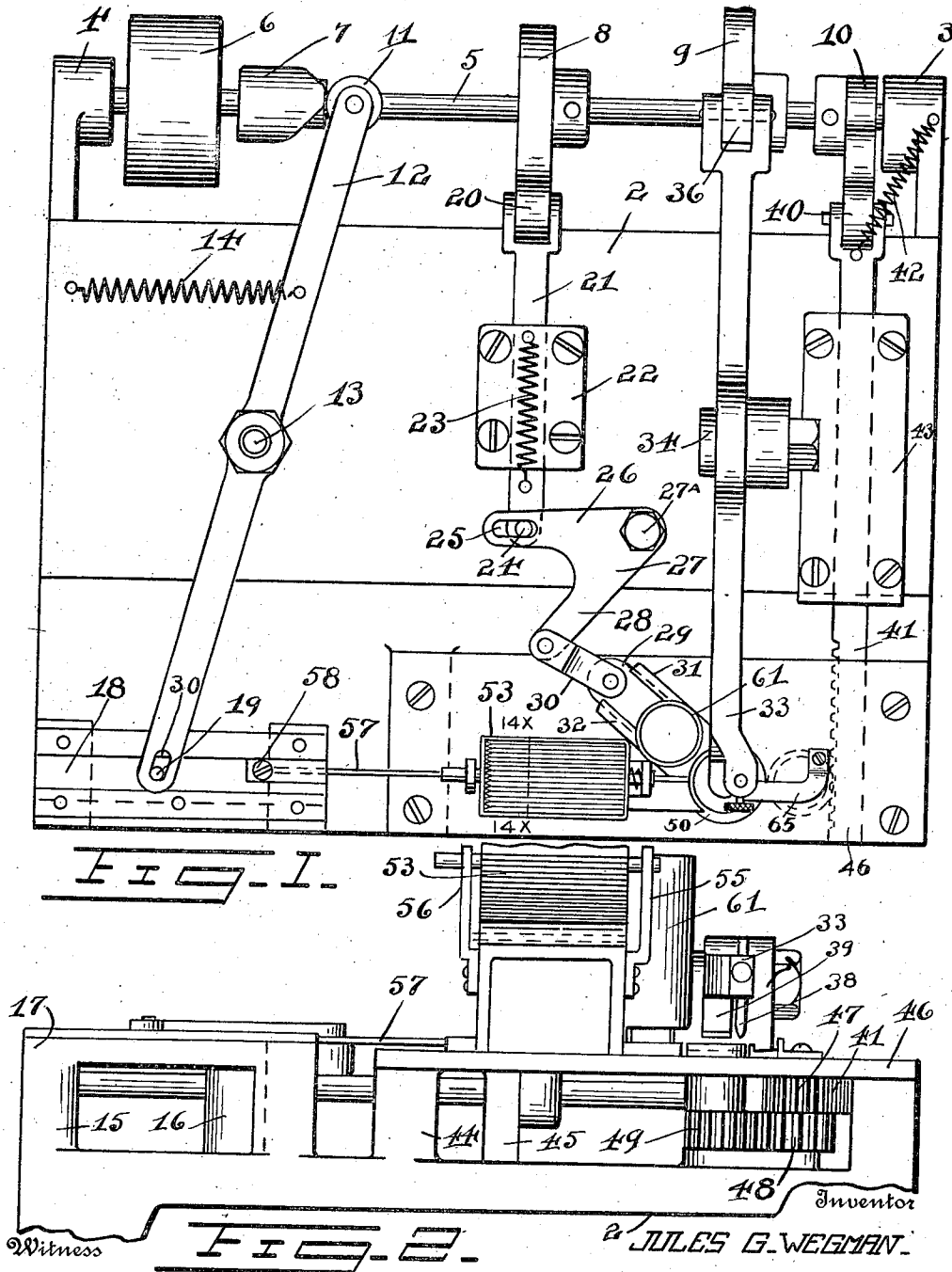
J. G. WEGMAN

1,463,565

PIN FORMING AND BUTTON PINNING MACHINE

Filed June 16, 1919

3 Sheets-Sheet 1



July 31, 1923.

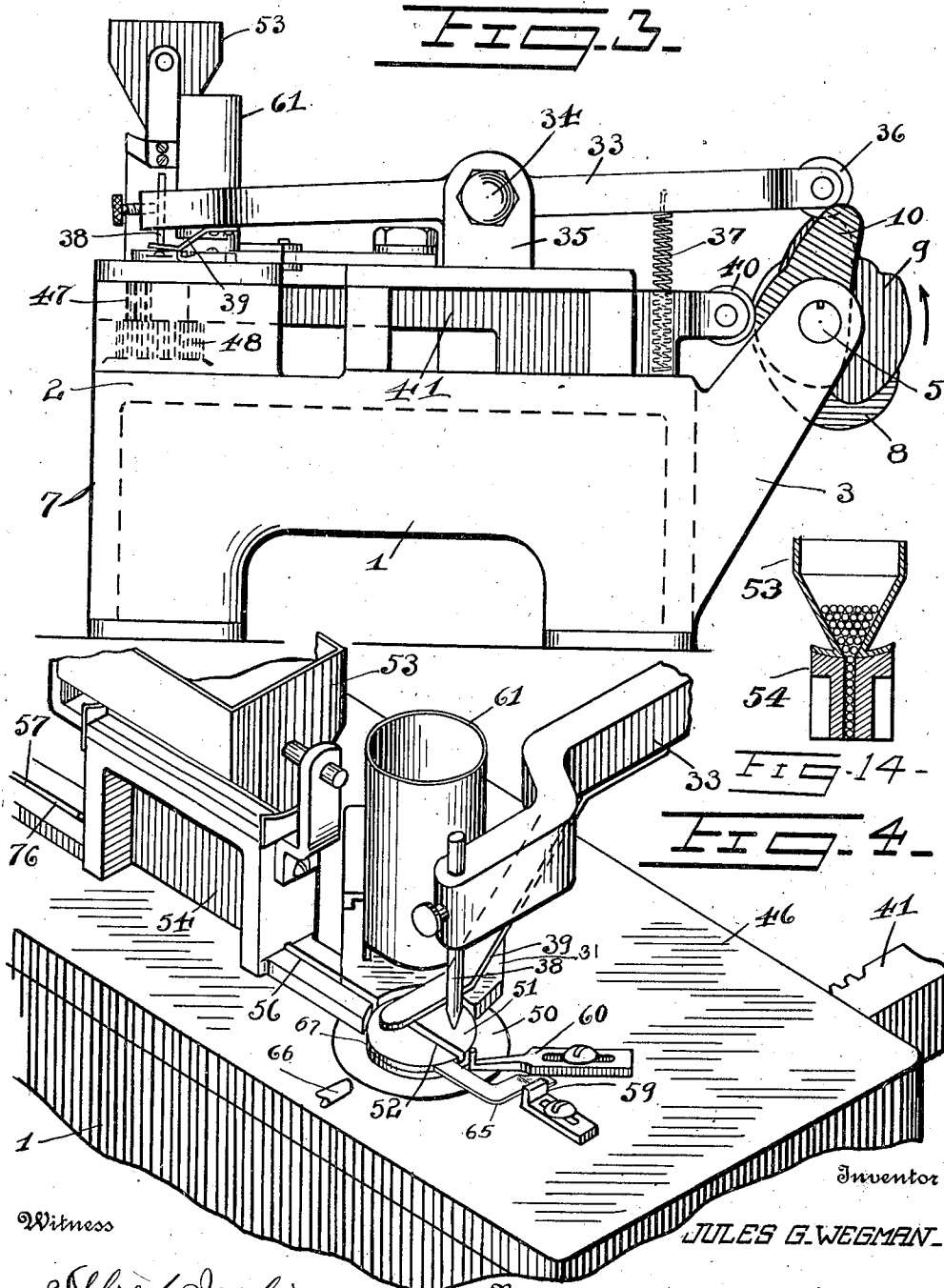
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PIN FORMING AND BUTTON PINNING MACHINE

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FIG. 5.

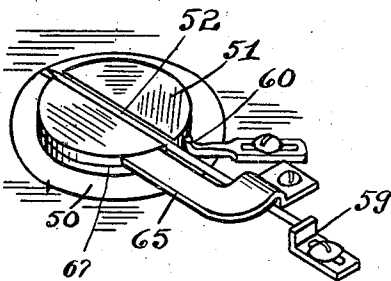


FIG. 6.

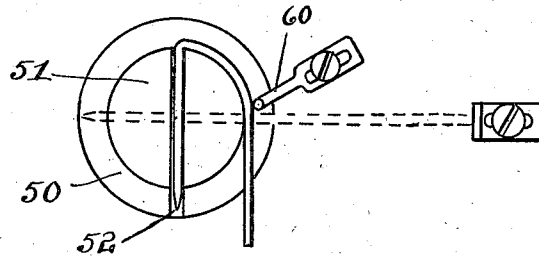


FIG. 11.

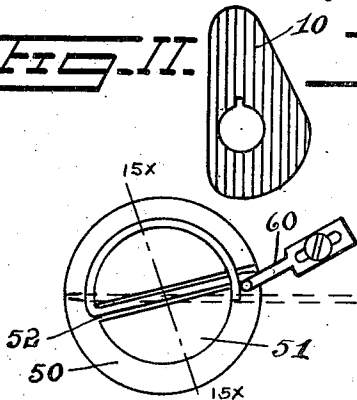


FIG. 12.

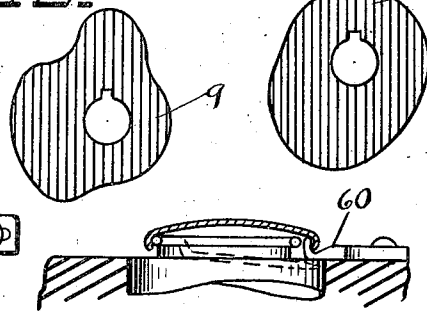


FIG. 13.

FIG. 7.

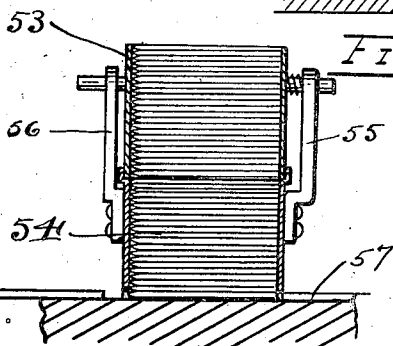


FIG. 15.

FIG. 8.

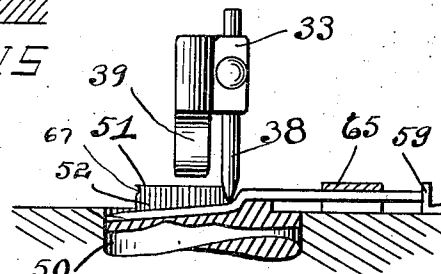


FIG. 10.

FIG. 9.

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UNITED STATES PATENT OFFICE.

JULES G. WEGMAN, OF ROCHESTER, NEW YORK.

PIN-FORMING AND BUTTON-PINNING MACHINE.

Application filed June 16, 1919. Serial No. 304,596.

To all whom it may concern:

Be it known that I, JULES G. WEGMAN, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Pin-Forming and Button-Pinning Machines, of which the following is a specification.

The object of this invention is to provide a new and improved form of machine for forming pins and attaching them automatically to hollow buttons such as are used for advertising purposes.

This and other objects of this invention will be fully illustrated in the drawings, described in the specification and pointed out in the claims at the end thereof.

In the accompanying drawings,

Figure 1 is a top plan view of the pin forming and button pinning machine.

Figure 2 is a front elevation of the machine.

Figure 3 is a side elevation of the machine.

Figure 4 is a perspective view of a portion of the machine showing the hopper for the pins, the hopper for the buttons and the pin forming arbor.

Figure 5 is a detail perspective view of the pin forming arbor.

Figures 6 and 7 are top plan views of the arbor shown in Figure 5 showing successive positions thereof while the pin is formed thereon.

Figure 8 is a side elevation of the pin forming arbor with a hollow button placed over it ready for the pin to be inserted therein, the button being shown in section.

Figure 9 is a sectional view of the arbor with a pin in place thereon showing how the pin is offset in the arbor.

Figure 10 is a sectional view thru the hopper containing the pins.

Figures 11, 12 and 13 are detail views of certain cams.

Figure 14 is a vertical sectional view of the hopper from which the pins are fed, the section being taken on the line 14*-14* of Figure 1.

Figure 15 is a vertical sectional view of the mandrel for forming the pins, the section being taken on the line 15*-15* of Figure 7.

In the several figures of the drawings, like reference numerals indicate like parts.

The machine hereinafter described is mounted on a suitable frame 1 having a bed

plate 2 provided at the top thereof. A pair of rearwardly projecting lugs 3 and 4 are provided with suitable bearings in which the power shaft 5 is mounted to rotate. The shaft 5 is driven by a pulley 6 which is keyed to the shaft 5 and is driven from either a line shaft or an individual electric motor. Also keyed on the shaft 5 are the cams 7, 8, 9 and 10. Each of these cams is designed to perform a function in the feeding of the pin and buttons in the forming of the pins and the placing of the formed pins into a hollow button. These cams turn to the left as shown at the top of Figure 3.

The cam 7 is a cylindrical cam and has its cam surface at one side thereof over which the anti-friction roller 11 is adapted to travel. The roller 11 is mounted on the outer end of the arm 12, which arm is mounted to swing on the pivot pin 13 suitably mounted on the bed plate 2. The roller 11 is held in contact with the cam surface of the cam 7 by means of the spring 14 which is fastened at one end thereof to the arm 12 and at the other end thereof to the bed plate 2.

Supported on a pair of lugs 15 and 16 provided near the front of the machine is a channel 17 in which the slide 18 is mounted to travel. The slide 18 is provided with a pin 19 which projects upwardly and engages the slot 30 provided in the free end of the arm 12 so that on the reciprocation of the arm 12 which is caused by the rotation of the cam 7 the slide 18 is carried back and forth.

The cam 8 is a disc cam and its periphery is adapted to engage the anti-friction roller 20. This roller is carried on the end of the sliding bar 21 on which it is mounted to rotate. The bar 21 is mounted to slide in a suitable bearing 22 provided on top of the bed plate 2. A spring 23 is provided fastened at one end to the bar 21 and at the other end to the bearing 22 and holds the anti-friction roller 20 on the end of the bar 21 against the periphery of the cam 8.

A bell crank 27 is provided mounted to swing on a suitable pivot 27^A. One leg of this bell crank 26 is provided with a slot 25 which engages with the pin 24 carried on the end of the bar 21. The other leg 28 of the bell crank is connected to the feed plate 29 by means of the link 30. The feed plate 29 is adapted to slide between the guides 31 and

32 and reciprocates between them on the reciprocation of the bar 21 caused by the rotation of the cam 8.

As will be seen from an inspection of Figures 3 and 4, the guideway over which the buttons are fed from their hopper is elevated from the base plate 46 so that the buttons fed therethrough will be placed over the top of the mandrel so as to allow the spring presser foot to force them down over it as soon as the button is centrally located thereon. The buttons from the hopper are thus slipped under the presser foot which forces them over the post 51 and holds them in place thereon while the pin is attached to the inside thereof.

The disc cam 9 operates on the arm 33 which is mounted to rock on the stud 34 carried on the upright 35 mounted on the bed plate. An anti-friction roller 36 carried on the end of the arm 33 is held in contact with the periphery of the cam 9 by means of the spring 37 which is connected at one end to the arm 33 and at the other end to the bed plate 2.

The free end of the arm 33 carries the bumper pin 38 and the spring foot 39 which are used for a purpose which will presently appear.

The disc cam 10 makes engagement with the anti-friction roller 40 carried on the end of the sliding rack 41. The roller 40 is held in contact with the periphery of the cam 10 by means of the spring 42 which is fastened at one end to the sliding rack 41 and at the other end to the lug 3.

The rack 41 is mounted to slide in the bearing 43 provided on the bed plate 2 so as to hold it to a straight line movement during its reciprocation.

A pair of lugs 44 and 45 provided near the front of the bed plate 2 and in line with the lugs 15 and 16 are adapted to support the supporting plate 46.

Mounted to rotate between the supporting plate 46 and the bed plate 2 is a train of gearing comprising the pinions 47, 48 and 49. The pinions 47 and 48 are held together and rotate idly around a stud carried on the bed plate 2. The pinion 47 which is of a smaller diameter than the pinion 48 is adapted to mesh with the sliding rack 41. The movement imparted to the pinion 47 by the sliding rack 41 on the reciprocation thereof is imparted to the pinion 49 thru the pinion 48, which pinions mesh with each other. The pinion 49 is fastened to the reduced end of the arbor 50, which arbor is adapted to oscillate in the supporting plate 46, being driven by the rack 41.

The arbor 50 has an extension or post 51 of reduced diameter provided at the top thereof, which post projects above the supporting plate 46. The arbor 50 and the post 51 have a slot 52 cut diametrically across

their face into which the pins are fed prior to the forming of them as will hereinafter be described. The slot 52 is shallow and horizontal for a short distance and then suddenly increases in depth with a shoulder from which it then gradually slopes downward. (See Figure 9.) The arbor and post may be referred to as a mandrel.

Mounted on the supporting plate 46 at the left of the arbor 50 is the pin hopper which comprises two sections 53 and 54. The upper section 53 is mounted to rock between the brackets 55 and 56 carried on the lower section 54. The upper section 53 enlarges towards the top in order to provide space for a great number of pins which are successively fed to the forming arbor.

In order to prevent clogging up of the hopper pins are allowed to drop from the upper section 53 of the hopper to the lower section 54 only when the openings between them are in register. These openings are wide enough to permit but one pin to pass at a time. In other words, two pins cannot pass abreast although one or more pins may pass in succession for each swing of the hopper.

The lower section 54 has the width of the thickness of one of the pins so that only a single row can be stacked up therein. As the upper section 53 is rocked over the lower section 54 the opening in the bottom of the section 53 is made to register with the top of the section 54 and one or more pins at a time are allowed to drop into it before the section 53 is brought to its normal position in which the pins are prevented from dropping from the upper section to the lower section of the hopper. The pins stand in both sections with the point to the left as shown in Figure 10.

A groove 76 is cut into the supporting plate 46 in line with the hopper 54. The lowest pin of the hopper rests in this groove. Through this groove the pins may successively be guided into the slot 52 in the arbor 50. The feeding of the pins from the hopper 54 is performed by the needle 57, which needle is carried on the slide 18 to which it is fastened by means of the set screw 58.

On the reciprocation of the slide 18 by the arm 12 the needle 57 moves under the hopper 54 and forces the lowest pin along the groove 76 into the slot 52 in the arbor which is positioned to receive it. The blunt end of the pin passes thru and beyond the slot 52 and rests against the stop 59, the pointed end of the pin being at the other end of the slot in the arbor. The needle 57 is then withdrawn from below the hopper 54 allowing another pin to drop from the hopper into the groove 76 ready to be forced out therefrom into the slot in the arbor.

The blunt end of the pin is guided by the flat spring bracket 65 under which the

pin passes and is held in place thereby, first while the offset is being bent in the pin and later while the pin is being bent around the post.

5 While the pin is in this position and before the arbor turns, the arm 33 descends with the bumping pin 38 and strikes the pin in the slot 52 and bends the pin at the shoulder in the slot with a reverse bend
10 forming an offset on the pin which offset holds the pointed end of the pin in a lower plane than the blunt end of the pin. (See Figure 9.)

15 When the bumping pin descends, the presser foot 39 descends with it and makes contact with the post first. The presser foot then yields and lets the pin 38 pass by it.

20 While the pin is being bent, the bracket 65 holds the end of the pin down and prevents it from being bent up and thus forces the pin to take a double bend. The free end of this bracket 65 extends forward to the post although it need not make contact with
25 the post. When the post revolves, the pointed end of the pin is carried under the end of the bracket and is held down by it so that it will pass under the finger 60 and not engage therewith.

30 After the pin has been bent in this way, the cam 10 operates to reciprocate the rack 41 which oscillates the pinion 47, which in turn oscillates the arbor 50 thru the pinions 48 and 49. When the arbor turns in one direction it carries the pin with it which immediately makes contact with the finger 60
35 by which it is bent against the periphery of the post 51, it being forced into a groove 67 provided in the post 51 which holds the pin more firmly in place thereon.

40 The arbor 50 is turned slightly more than 180 degrees, during which time the blunt end of the pin is formed into a semi-circle with the pointed end thereof extending across and projecting outwardly therefrom and slightly beyond it.

45 Just before the forming of the circular part of the pin is complete and before the blunt end of the pin passes the end of the finger 60, a hollow button such as is used for advertising purposes is slipped over the post 51 and the semi-circle of the pin formed thereon so that when the blunt end of the pin has passed the finger, the circular
55 part of the pin formed on the arbor will expand and automatically snap into place in the groove of the button. After this is completed the cam 10 operates to drive the rack in the reverse direction and this in turn oscillates the arbor and post in the reverse direction back to the starting position shown in Figure 5.

60 The buttons to which the pins are attached are fed from the hopper 61 in which they are stacked up in a single column.

The feed plate 29 is adapted to slide into the hopper 61 near the bottom thereof and force the lowermost button contained therein out of the hopper and slide it over the top of the post 51 until its edge encircles
70 the post 51, in which position the presser foot 39 operates to force the button over the post 51 and hold it in place thereon until the pin is released from the arbor and allowed to snap in place in the button. 75

At this time the arm 33 and the presser foot 39 are normally arrested by the cam 9 with the presser foot about $\frac{1}{4}$ " above the post. As the button slides under the presser foot, the presser foot is sprung upwardly
80 and when the button is positioned over the post, the presser foot springs downwardly again and forces the button to position on the post. The diameter of the post and other parts is such that the post, the bent
85 portion of the pin and the upturned end of the finger can all engage inside of the button so that the button slides down over and envelops all of these parts as shown in Figure 8. Immediately after the button has
90 reached this position, the blunt end of the pin passes the finger 60 and is released thereby so it can expand or spring to its natural shape and in so doing it engages with the inside of the button and is held
95 thereby. It will also be understood that the slot 52 is much wider than the pin and has V-shaped sides so that the pin is loose therein and when the bent part of the pin springs to engagement with the hollow button, the
100 straight part of the pin can disengage itself from the slot or turn sidewise therein and follow the button. After the button and pin have come together the cam raises the arm 33 until the presser foot is about $\frac{1}{2}$ "
105 above the post, at which time the button with the pin attached thereto may be blown off of the post. The air blast is furnished by a tube 66. Thereafter, a new pin is inserted in the post and the operation is repeated as above described. The cam 9 is cut to secure this result in the movement of the arm 33.

I claim:

1. In a button pinning machine, the combination of means for feeding buttons, means for feeding pins, means for bending a portion of each pin to conform to the shape of the button and means for bringing the button and pin together and inserting the bent portion of the pin within the button. 115

2. In a button pinning machine, the combination of means for feeding buttons, means for feeding pins, means for bending a portion of the pin and holding it under tension, and means for inserting the bent portion of the pin into the hollow part of the button and releasing it therein. 120

3. In a button pinning machine, the com- 125 130

- bination of a mandrel having a slot across the end thereof adapted to receive a pin, means for revolving the mandrel, and means for causing the exposed end of the pin to bend around the outside of the mandrel as the mandrel revolves, said means permitting the bent portion of the pin to expand away from the mandrel when the bend has been completed.
4. In a button pinning machine, the combination of a mandrel, said mandrel having a slot across the end thereof capable of receiving a portion of a pin therein, means for turning said mandrel, and a stop for bending the exposed portion of the pin around the mandrel as it turns, permitting the bent portion of the pin to spring away from the mandrel after the end of the pin passes the stop.
5. In a button pinning machine, the combination of a mandrel having a slot across the end thereof, said slot being shallow at one end and being deep for the rest of its length with a shoulder between the two depths.
6. In a button pinning machine, the combination of a hopper for pins and a hopper for buttons, a mandrel having a slot in the end thereof, means for feeding the pins one at a time into said slot with the pointed end of the pin in the slot and the butt end of the pin outside of the slot, means for offsetting the pin in the slot, means for bending the pin around the mandrel, and means for passing a hollow button over the top of the mandrel permitting the pin to expand into the button, the pin being removed from the mandrel with the button.
7. In a button pinning machine, the combination of a shaft, a series of cams thereon, means operated by one of said cams to feed pins, means operated by a second cam to form the pins at one end, means operated by a third cam to form the pins at the other end, and means operated by a fourth cam to bring the button and the pin together and permit the pin to engage the button.
8. In a button pinning machine, the combination of a rotating cam, a lever operated by said cam, a slide moved by said lever, a needle operated by said slide, a grooved plate in which said slide reciprocates, and a hopper containing pins positioned over and feeding into the groove of said plate.
9. In a button pinning machine, a mandrel having a groove across the end thereof, a shoulder located in said groove, said groove being adapted to receive one end of a pin, and means for bumping the pin at said shoulder and forming an offset therein in the pin.
10. In a button pinning machine, a mandrel having a groove across the end thereof, a shoulder located in said groove, said groove being adapted to receive one end of a pin, means for bumping the pin at said shoulder and forming an offset thereat in the pin, means for bending about the mandrel one of the free ends of the pin projecting outside of the groove in said mandrel and means for feeding a hollow button over said mandrel and pressing it down on the mandrel and over the bent portion of said pin.
11. In a button pinning machine, the combination of a mandrel having a groove across the end thereof adapted to receive a pin, a guide bracket located adjacent to said mandrel and adapted to guide the pin carried by said mandrel, and a finger mounted adjacent to said mandrel against which the pin is carried on the rotation of the mandrel and by which it is bent around the mandrel, said bracket serving to hold the pin in engagement with the mandrel.
12. In a button pinning machine, the combination of a mandrel having a groove across the end thereof adapted to receive a pin, a guide bracket located adjacent to said mandrel and adapted to guide the pin carried by said mandrel, a finger mounted adjacent to said mandrel against which the pin is carried on the rotation of the mandrel and by which it is bent around the mandrel, said bracket serving to hold the pin in engagement with the mandrel, and means for oscillating the mandrel.
13. In a button pinning machine, a mandrel having a groove across the end thereof, a shoulder located in said groove, said groove being adapted to receive one end of a pin, a pin for bumping said pin and forming a shoulder thereon, an arm on which said bumping pin is carried, and a presser foot carried on said arm, said bumping pin working past said presser foot, said foot yielding to permit the working of the bumping pin and the engagement of the button with the mandrel.
14. In a button pinning machine, the combination of a mandrel with a slot across the end thereof, a stationary upturned finger beside said mandrel, means for rotating the mandrel and causing it to bend a pin between the mandrel and the finger, said mandrel and said finger being capable of receiving a button thereon, enveloping said pin, said mandrel and the end of said finger, the end of said pin springing into engagement with the button as soon as it is past the finger.
15. In a button pinning machine, the combination of means for feeding buttons, means for feeding pins, means for bending and holding the pins under tension, means for placing the button over the pins while under tension, means for engaging the pins with the buttons by releasing them therein.
16. In a button pinning machine, the combination of means for feeding buttons, means

for feeding pins, a mandrel having a slotted head to receive a part of the pin, means for feeding pins into the slotted head of said mandrel, means to rotate the mandrel to bend a portion of the pin around the mandrel, and means to place a button over said slotted mandrel after a pin has been bent thereon, and means to release the bent portion of the pin into the inside of the button placed over the mandrel and allow part of the unbent portion of the pin to overlap the edge of the button.

17. In a button pinning machine the combination of a horizontal pin feeding mechanism, a horizontal button feeding mechanism located angularly adjacent to said pin feeding mechanism, both of said feeding mechanisms having a common feeding point, a revolving mandrel located at the common

feeding point of both of said mechanisms adapted to receive both the pins and the buttons fed thereby, a presser foot mounted above said mandrel adapted to force the buttons fed by said button feeding mechanism over said mandrel said mandrel having a V shaped slot formed in the top thereof adapted to receive the pins fed by said pin feeding mechanism, a hammer co-operating with the slot in said mandrel to form an offset in the pin located in the slot, means for rotating said mandrel to form a loop on each pin, the loop being held under tension while being formed on said mandrel, and means to release the pin formed on said mandrel and allowing it to expand into the button held in place over said mandrel.

In testimony whereof I affix my signature.

JULES G. WEGMAN.