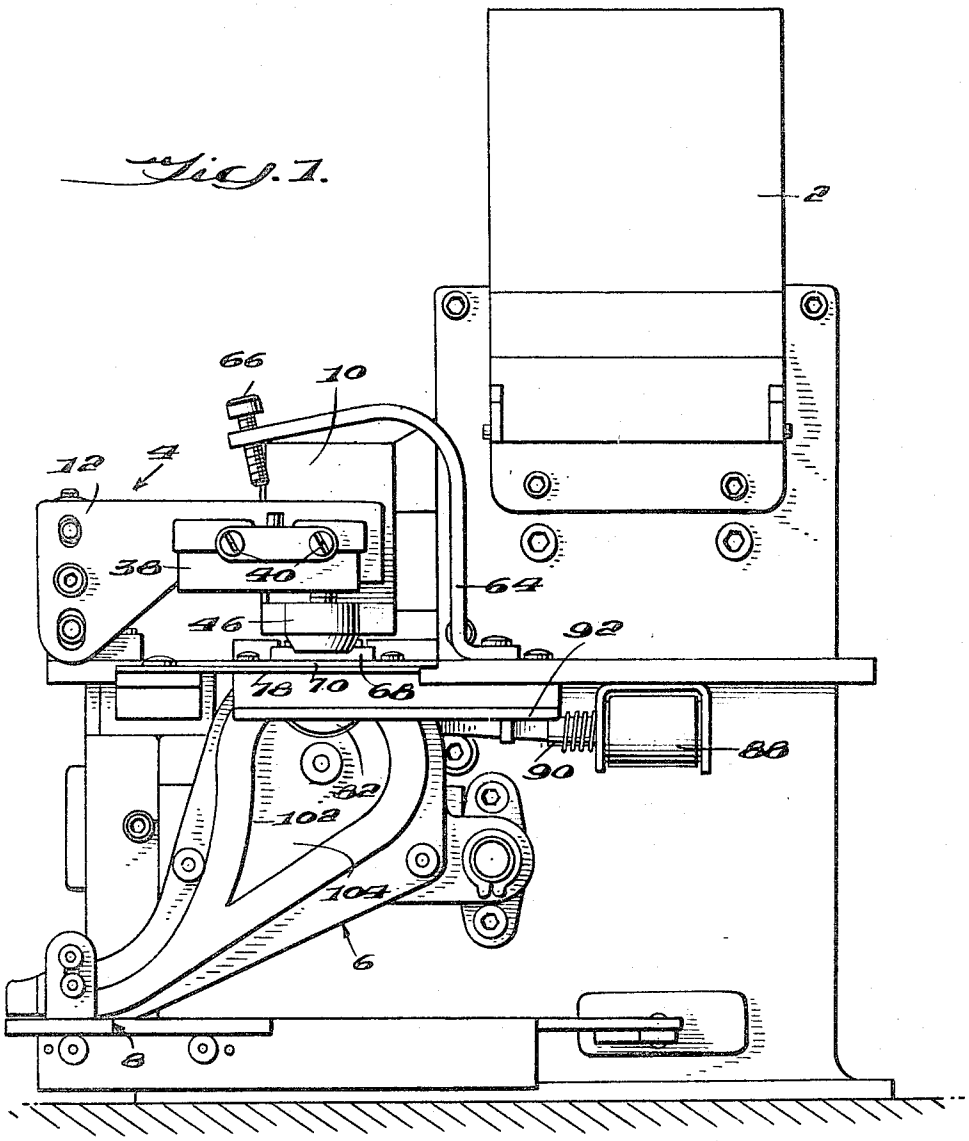
May 7, 1968 H. C. DANNHARDT ETAL 3,381,827

BUTTON FEEDING MACHINES

Filed Nov. 5, 1965 4 Sheets-Sheet 1

Fig. 1.



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BUTTON FEEDING MACHINES

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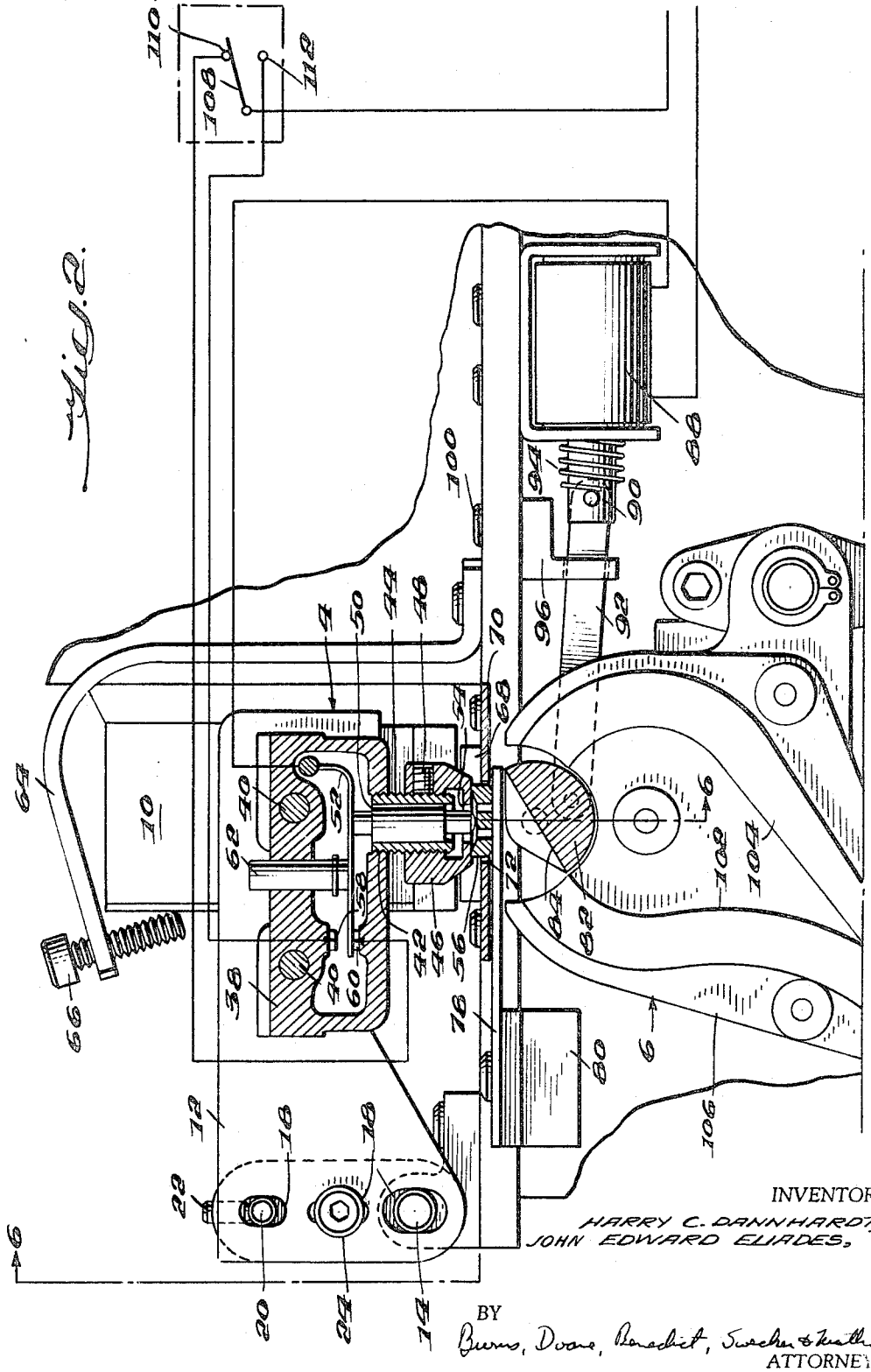


Fig. 2.

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BUTTON FEEDING MACHINES

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Fig. 4.

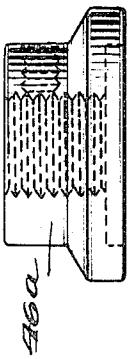


Fig. 5.

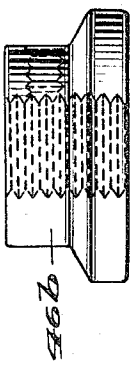
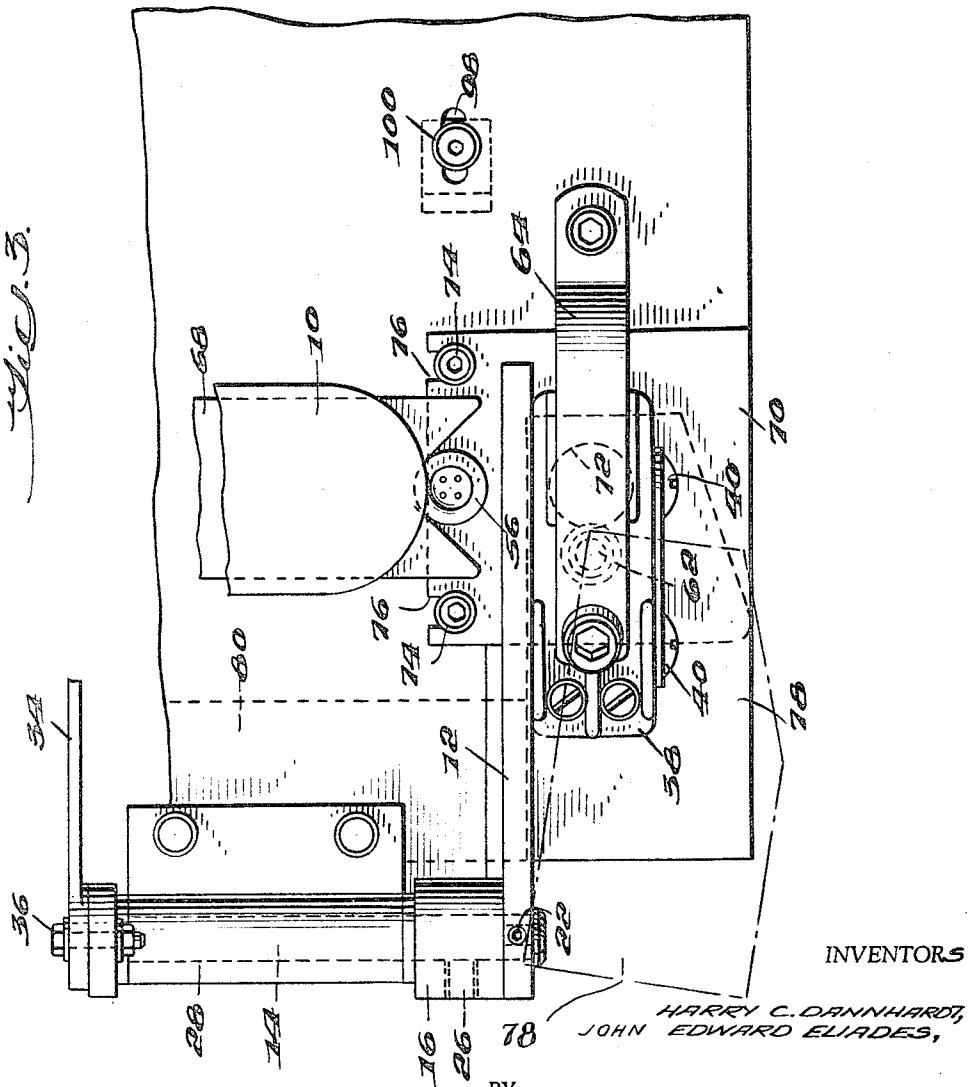


Fig. 3.



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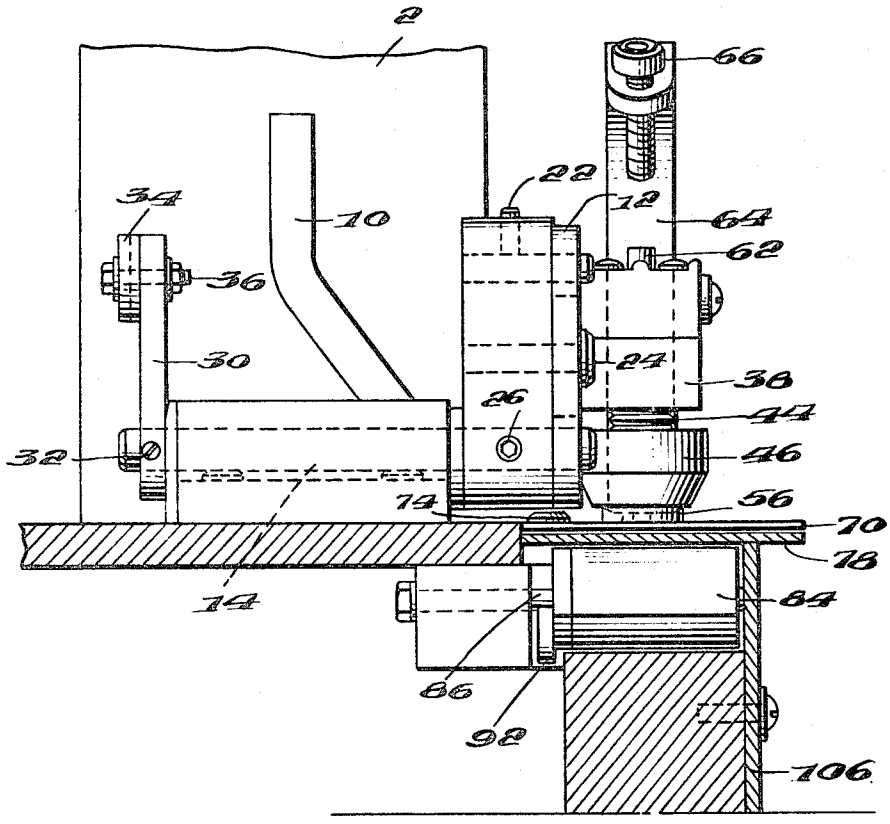
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BUTTON FEEDING MACHINES

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Fig. 6.



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BUTTON FEEDING MACHINES

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11 Claims. (Cl. 214—1)

ABSTRACT OF THE DISCLOSURE

A device for feeding a series of concave or convex buttons with the same side of each button facing in the same direction. Each button is deposited in an opening in a plate and supported in the opening by a movable shelf. A plunger and an abutment concentric with the plunger are mounted on an arm over the opening and movable into engagement with one face of the button. The distance between the end of the plunger and the abutment indicates which side of the button is facing the plunger. The relative positions of the plunger and the abutment are sensed by a switch means which operates a horizontally tilting surface directly under the shelf. A chute is provided on each side of the tilting surface. A button passing through one chute is turned over before reaching the delivery point at the bottom of the chute, while a button passing through the other chute remains in the same position when it reaches the delivery point. The switch operated by the plunger and abutment controls the position of the tilting surface to deflect the button into one chute or the other as it drops from the opening. Thus the button is either turned over or remains with the same side up depending upon the relative positions of the plunger and the abutment.

This invention relates to button feeding machines and more particularly to apparatus for selectively inverting randomly oriented buttons in order to supply a series of buttons with a predetermined side facing up.

Button feeding machines are used in the garment industry to supply buttons to a sewing machine where the buttons are sewn on the garment. The buttons are usually stored in a hopper and are transferred from the hopper through a chute where the buttons are arranged in a row, but they are randomly oriented. Not all of the buttons have the same side exposed. Some of the buttons in the row have the wrong side facing up. The buttons must be fed to the sewing machine with all the buttons facing in the same direction. Therefore, some means must be provided for inverting those buttons supplied from the hopper that have the wrong face exposed.

There are many different styles and types of buttons, but generally they are either concave or convex. Heretofore, it has been proposed to determine the orientation of the button by comparing the thickness of the button at the center with the thickness at the rim of the button. Button inverting mechanisms operating in response to the thickness of buttons are not very reliable, since the thickness of buttons is not accurately controlled and there are wide variations in thickness between buttons of the same style and size.

Buttons are manufactured in many different sizes and it is often necessary to change the size of buttons that are being fed to a sewing machine. If a great deal of time is required for adjusting the machine to operate on different sizes of buttons or on different types of buttons, then the production rate of the operator and the equipment declines. It is therefore desirable for the button inverting

mechanism to be quickly and easily adjusted for receiving different sizes and types of buttons.

Accordingly, it is an object of this invention to provide apparatus for selectively inverting a series of buttons with a predetermined side facing up.

It is a further object of this invention to provide button inverting apparatus which operates effectively although there are variations in thickness of the buttons.

A still further object of this invention is to provide a button inverting machine which is readily adjusted for different sizes and types of buttons.

These objects are accomplished in accordance with a preferred embodiment of the invention by button inverting apparatus which receives randomly oriented buttons. A button is deposited on a movable shelf and a pair of feelers compares the elevation of the center of the button with the elevation of the rim of the button. Directly under the shelf there is a pair of chutes. One of the chutes turns a button over as it falls down the chute, while the other chute does not turn the button over. After the feelers determine whether the button is right side up or upside down, the shelf is withdrawn, allowing the button to fall off of the shelf. A diverter device under the shelf deflects the button into one or the other of the chutes, depending upon the relative positions of the feelers. The chutes have a common outlet from which the buttons are fed to the sewing machine. An electrical circuit is preferably provided for operating the diverter in response to the relative positions of the feelers.

This preferred embodiment is illustrated in the accompanying drawings, in which:

FIG. 1 is a front elevational view of the button feeding machine of this invention;

FIG. 2 is an enlarged front elevational view, partially in cross section, of the button feeding machine, showing the button inverter apparatus;

FIG. 3 is a top plan view of the button inverter apparatus;

FIG. 4 is a detail view of a modified button engaging member;

FIG. 5 is a second modified form of the button feeder element; and

FIG. 6 is a side elevational view of the button feeding machine.

Referring to FIG. 1, the button feeding machine of this invention includes a conventional hopper 2, a mechanism 4 for determining whether the observe or reverse side of the button is facing up, a device 6 for selectively turning buttons over, and an arm 8 or other means for transferring a button from the button feeding machine to a sewing machine where the buttons are sewn on a garment.

The hopper 2 is of conventional construction and is shown merely schematically. The hopper includes a receptacle for holding a supply of buttons and a mechanism for delivering one button at a time to a chute 10 at regular intervals. The chute 10 is in the form of a wide, hollow channel. Buttons are dispensed individually from the hopper into the chute 10. Each button slides downwardly toward the button feeler mechanism 4. The slide 10 is sufficiently wide to accommodate the sizes of buttons that are normally used.

The button feeler mechanism 4 determines automatically whether the obverse or reverse side of the button is facing up. The feeler mechanism 4 includes an arm 12 which is journaled on a shaft 14, as shown in FIGS. 2 and 3. The arm 12 is supported on a bracket 16. The arm 12 has a plurality of vertical slots 18 and a peg 20 extending outwardly from the bracket 16 is received in the upper slot 18. The shaft 14 extends through the lower slot 18, and since all three of the slots 18 extend in substantially the same direction, the arm 12 may be adjusted

vertically relative to the bracket 16. A screw 22 in the arm 12 engages the peg 20 and by turning the screw 22, the arm 12 may be displaced vertically relative to the bracket 16. When the position of the arm is adjusted, a clamping screw 24, which extends through the middle slot 18 and into the bracket 16, secures the arm against movement relative to the bracket 16. The bracket 16 is secured to the shaft 14 by a set screw 26, and the shaft 14 is journaled in a bearing 28. At the opposite end of the shaft 14, a crank arm 30 is secured to the shaft 14 by a set screw 32, as shown in FIGS. 3 and 6. A lever 34 is secured to the crank 30 by a bolt, and longitudinal movement of the lever 34 causes the shaft 14 to rotate, thereby raising and lowering the free end of the arm 12.

A switch housing 38 is secured to the arm 12 by a pair of screws 40. The housing 38 has an internally threaded bore 42 and an externally threaded sleeve 44 is received in the bore 42. A feeler ring 46 is threaded on the lower end of the sleeve 44. The ring 46 is prevented from turning by a set screw 48. Inside the sleeve 44 there is a plunger 50. The central portion of the plunger 50 has substantially the same diameter as the sleeve 44, so that it is journaled for reciprocating movement therein. The upper end of the plunger 50 is secured by welding or other means to a flat spring 52. Thus, the spring 52 prevents the plunger 50 from falling out of the end of the sleeve 44. The lower end of the plunger 50 projects through a central opening 54 in the ring 46 and the extent of projection of the plunger 50 relative to the plane of the lower surface of the ring 46 may be adjusted by turning the ring relative to the sleeve 44.

The ring 46, as shown in FIG. 2, is designed for use with concave buttons, "fish eye" buttons, and for small diameter convex buttons. The ring 46*a* that is shown in FIG. 4 may be substituted for the ring 46 in FIG. 2, for use with large diameter convex buttons. The ring 46*b* that is shown in FIG. 5, may be substituted for the ring 46 in FIG. 2 for use with large diameter concave buttons.

Inside the housing 38, there are a pair of contacts 58 and 60, and the spring 52 extends between these contacts. The spring 52 is in the form of a snap switch. Normally, the spring engages the contact 60, but when the spring resistance is overcome, the end of the spring moves from the contact 60 to the other contact 58, without any additional force being applied. A reset plunger 62 extends through an opening in the top of the housing 38 and is journaled therein for reciprocating movement. The lower end of the plunger 62 is secured to the spring 52 by welding or other suitable means. A bracket 64 is supported on the machine frame and extends above the housing 38, as shown in FIGS. 3 and 6. A screw 66 extends through the bracket 64 and is in position to engage the reset plunger 62, when the arm 12 is in the raised position. When the plunger 50 is displaced upwardly, for example by an upside down button under the ring 46, the spring 52 would snap against the upper contact 58 and raise the plunger 62. Subsequently, when the arm 12 is raised, the reset plunger 62 engages the end of the screw 66, and the downward force of the plunger 62 on the spring 52 causes the spring to snap back against the lower contact 60. Thus, the spring 52, if displaced, remains in engagement with the contact 58 until the arm 12 is raised sufficiently for the plunger 62 to engage the screw 66.

Buttons are conveyed one at a time down the chute 10. At the bottom of the chute 10, the button is supported on the top of a pusher 68 which reciprocates under the lower end of the chute 10. The end of the pusher 68 is in the shape of a V, and when the pusher 68 is retracted past the opening in the bottom of the chute 10, the button drops in front of the pusher and movement of the pusher toward the measuring ring 46 causes the button to be centered in the V portion of the pusher 68. Since the buttons are dispensed individually from the hopper and the chute 10, various sizes and thicknesses and types of buttons may be dispensed from the same chute 10 without requiring any adjustments in the chute. Furthermore, the V portion on the end of the pusher 68 centers the buttons received from the chute 10, regardless of the sizes of buttons. A locater plate 70 is mounted on the machine frame under the housing 38, as shown in FIGS. 2, 3 and 6. In the center of the plate 70 there is a circular opening 72 for receiving a button 56. The plate 70 is secured to the frame of the machine by screws 74, which extend through slots 76 in the plate 70. When the screws 74 are loosened, the plate 70 may be removed merely by sliding the plate outwardly away from the chute 10. Plates having different sizes of openings 72 may be substituted for the plate 70 to accommodate different sizes of buttons, so that the buttons will be centered under the ring 46. The pusher 68 is aligned with the opening 72 in the plate 70 and conveys a button from the chute 10 to the opening 72 in timed relation to the movement of the arm 12. The button 56 is supported in the opening 72 by a shelf 78 while its orientation is being determined. The shelf 78 is supported on an arm 80 extending outwardly from the frame, as shown in FIGS. 2 and 3.

The arm 80 is mounted for swinging movement relative to the plate 70. The arm 80 moves the shelf 78 in an arc to the position shown in dotted lines in FIG. 3. In this position, the shelf 78 no longer underlies the opening 72 in the plate 70. Consequently, a button that was lodged in the opening 72 now falls through the opening to the selective inverter device 6. A diverter bar 82 extends outwardly from the frame directly beneath the opening 72 in the plate 70. One side of the bar 82 has a flat surface 84. The bar 82 is supported on a shaft 86 which is journaled in the machine frame, and the bar 82 rotates relative to the frame. Rotational movement of the bar 82 is controlled by a solenoid 88, as shown in FIG. 2. The soleioid 88 has an armature 90 and the armature is connected to the bar 82 by a link 92. The ends of the link 92 are secured to the bar 82 and the armature 90 by pins to permit rotational movement of the link relative to the bar 82 and the armature 90. A spring 94 normally urges the armature 90 toward the left, as viewed in FIG. 2, and a stop member 96 limits the movement of the armature under the action of the spring 94. The position of the stop 96 on the frame may be adjusted by means of a slot 98 in the machine frame and a screw 100, as shown in FIG. 3. When the solenoid is energized, the armature 90 is drawn toward the right, as viewed in FIG. 2, against the force of the spring 94. Thus, when the solenoid is energized, the flat surface 84 of the bar 82 is in the position shown in FIG. 2.

A pair of chutes 102 and 104 are mounted on the machine frame adjacent the diverter bar 82. As shown in FIG. 1, the chutes 102 and 104 converge into a single chute before they reach the transfer arm assembly 8. A transparent cover 106 is preferably provided over the front of the chutes 102 and 104, so that the buttons may be observed as they pass down the chute.

As shown in FIG. 2, when the flat surface 84 of the bar 82 is aligned with the first chute 102, a button falling on the surface 84 from the opening 72 will slide off the surface and down the chute 102, without turning over. On the other hand, if the bar 82 is caused to swing clockwise by the solenoid 88 until the surface 84 is aligned with the other chute 104, a button falling on the surface 84 from the opening 72 will be turned over in progressing down the chute 104. Thus, the position of the surface 84 determines whether a button will remain with the same side up, or be turned over in traveling from the opening 72 to the transfer arm mechanism 8.

The electrical circuit for operating the solenoid 88 is shown schematically in FIG. 2. The switch lever 108 has three positions. The lever 108 may engage either of the contacts 110 or 112, or it may be in a neutral position in which no current is supplied to the circuit. When the switch lever 108 is in the position shown in FIG. 2 in which it engages the contact 110, current flows to the

switch contact 60 in the housing 38. Since the spring 52 engages the contact 60, current flows through the spring and through the solenoid 88. The current flowing in the circuit energizes the solenoid 88, thereby retracting the armature 90 and swinging the bar 82 to the position shown in FIG. 2. With the switch lever 108 in engagement with the contact 112, current flows to the contact 58 in the housing 38 and when the spring 52 is in the position shown in FIG. 2, no current flows to the solenoid 88, and the spring 94 swings the bar 82 to the opposite position in which the flat surface 84 is aligned with the chute 104. Thus, the position of the switch lever 108 determines whether the buttons will have the obverse or reverse side facing up when they reach the transfer arm mechanism 8.

In operation, the hopper 2 is filled with buttons and they are fed individually from the hopper 2 to the chute 10. The pusher 68 reciprocates under the lower end of the chute 10. As the pusher 68 moves away from the openings 72 in the plate 70, the lower end of the chute 10 is uncovered sufficiently for the button to fall in front of the pusher 68. As the pusher 68 moves toward the opening 72, the arm 12 swings upwardly until the plunger 62 engages the screw 66. The screw 66 pushes the plunger 62 against the spring 52, so that the spring engages the contact 60 and the plunger 50 is in position for measuring the elevation of the center of the button relative to the ring 46. While the arm 12 is raised, the pusher 68 moves toward the opening 72 until the button 56 falls into the opening 72. The shelf 78 is in the position shown in full lines in FIG. 3 to support the button 56 in the opening 72. The pusher 68 then moves away from the opening for receiving the next button from the chute 10. The arm 12 swings downwardly until the ring 46 engages the button 56. If the button is concave, with the obverse side facing up, the plunger 50 is not displaced by the button, and the spring 52 remains in engagement with the contact 60. If the switch lever 108 is in engagement with the contact 110, the solenoid 88 will remain energized and maintain the bar 82 in the position shown in FIG. 2. After the ring 46 has engaged the button, the arm 80 swings the shelf 78 to the position shown in dotted lines in FIG. 3 to allow the button 56 to fall onto the flat surface 84 of the bar 82. Since the surface 84 directs the button toward the chute 102, the obverse side will remain facing up when the button reaches the transfer arm mechanism 8. The pusher 68, the lever arm 34, the arm 80, the transfer arm mechanism 8 and the hopper 2 may be operated by any suitable means, provided their movements are coordinated so that these components of the machine operate in the sequence described.

If the button 56 were upside down, with the reverse side facing up, the plunger 50 would have been pushed upwardly relative to the ring 46, when the ring 46 engaged the button. Displacement of the plunger 50 would have caused the spring 52 to snap from engagement with the contact 60 into engagement with the contact 58. This movement of the spring 52 cuts off the flow of current to the solenoid 88 and allows the spring 94 to turn the bar 82 clockwise until the surface 84 is aligned with the chute 104. When the shelf 78 swings away from the opening 72, the button is directed by the surface 84 into the chute 104 which turns the button over so that it will arrive at the transfer arm mechanism 8 with the obverse side facing up. On the next cycle of the arm 12, the screw 66 presses the plunger 62 downwardly and returns the spring 52 into engagement with the contact 60.

The orientation of the buttons may be reversed merely by moving the switch lever 108 from engagement with the contact 110 into engagement with the contact 112. When the switch lever 108 is in this position, the solenoid 88 is normally de-energized. Consequently, if a concave button has the observe side facing up, it will be turned over, while if it has the reverse side facing up, it will remain in that position when it reaches the transfer mechanism 8. However, if convex buttons are being measured, the position of the lever 108 has the opposite effect. By utilizing the alternate rings 46*a* and 46*b*, and adjusting the position of the rings relative to the plunger 50, the mechanism may be readily changed to accommodate different sizes and styles of buttons. For example, buttons having a convex obverse face and a flat reverse face, may be run through the machine using the modified ring 46*a*.

The advantages of the button inverting apparatus of this invention are that it may be readily adjusted to accommodate various sizes and shapes of buttons. Since the ring and plunger measure the height of the center of the button relative to the peripheral edges of the button, variations in thickness of the button do not affect the accuracy of the mechanism. Also, the switch lever 108 permits the orientation of the buttons to be changed rapidly, as desired.

While this invention has been illustrated and described in one embodiment, it is recognized that variations and changes may be made without departing from the invention as set forth in the claims.

We claim:

1. Apparatus for orienting buttons with a preselected side facing up comprising a base, an abutment having a central opening therein, a plunger, means mounting the plunger on said abutment for longitudinal movement through said opening, means for moving said abutment toward and away from said base, switch means operating in response to the relative positions of said abutment and said plungre, and means for turning a button over in response to the operation of said switch means, whereby a button deposited on the base with the wrong side up as determined by the abutment and plunger is turned over.

2. Apparatus for orienting buttons with a preselected side facing up comprising a locater plate, said locater plate having an opening therein, means for supporting a button in said opening, an abutment having a central opening therein, means supporting said abutment in alignment with said plate opening, said supporting means including means for moving said abutment toward and away from said plate opening, a plunger, means mounting said plunger on said abutment for longitudinal movement through said abutment opening, switch means operating in response to relative positions of said abutment and said plunger, and means for turning a button over in response to the operation of said switch means, whereby buttons placed in said plate opening are engaged by said abutment and plunger to determine which side is facing up and wrong side up buttons are turned over.

3. Apparatus for orienting buttons with a preselected side facing up comprising a shelf, a locater plate overlapping said shelf, said locater plate having an opening therein for receiving a button, an abutment having a central opening therein, means supporting said abutment over said plate opening, a plunger, means mounting said plunger for longitudinal movement through said abutment opening, switch means operating in response to relative positions of said abutment and said plunger, means for displacing said shelf away from said plate opening, first chute means for conveying a button away from said plate opening to another location with the same side up, second chute means for conveying a button away from said plate opening to said location and turning over the button, and means operating in response to said switch means for diverting a button from said plate opening to one of said first and second chute means in response to said switch means, whereby wrong side up buttons are diverted to said second chute means while right side up buttons are diverted to said first chute means.

4. Apparatus for orienting buttons with a preselected side facing up comprising a base, an abutment having a central opening therein, a plunger, means mounting the plunger on said abutment for longitudinal movement through said opening, an arm, means mounting said abut-

ment on said arm, means for swinging said arm toward and away from said base, switch means operating in response to relative positions of said abutment and said plunger, and means for turning a button over in response to the operation of said switch means, whereby wrong side up buttons are turned over.

5. Apparatus for orienting buttons with a preselected side facing up comprising a base, an arm, means mounting said arm for swinging movement toward and away from said base, a sleeve extending outwardly from said arm adjacent said base, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through the ring opening, switch means operating in response to the relative positions of said ring and said plunger, and means for turning a button over in response to the operation of said switch means, whereby wrong side up buttons are turned over.

6. Apparatus for orienting buttons with a preselected side facing up comprising a base, an arm, means mounting said arm for swinging movement toward and away from said base, a sleeve extending outwardly from said arm adjacent said base, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through the ring opening, means for adjusting said arm relative to said base, means for adjusting said ring relative to said sleeve, switch means operating in response to the relative positions of said ring and said plunger, and means for turning a button over in response to the operation of said switch means, whereby wrong side up buttons are turned over.

7. Apparatus for orienting buttons with a preselected side facing up comprising a base, an arm, means mounting said arm for swinging movement toward and away from said base, a sleeve extending outwardly from said bracket adjacent said base, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through the ring opening, a switch lever on said arm, first and second contacts on said arm, said plunger being connected with said lever and said lever normally being biased toward said first contact, and means for turning a button over in response to the engagement of said lever with said second contact, whereby displacement of the plunger relative to the head swings the switch lever from the first contact to the second contact to turn over wrong side up buttons that are inserted between the head and the base.

8. Apparatus for orienting buttons with a preselected side facing up comprising a base, an arm, means mounting said arm for swinging movement toward and away from said base, a sleeve extending outwardly from said arm adjacent said base, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through the opening, a switch lever on said arm, first and second contacts on said arm, said plunger being connected with said lever, means biasing said lever from a position midway between said contacts toward the closest one of said contacts to said lever, means for displacing said lever from engagement with said second contact and into engagement with said first contact upon swinging movement of said arm a predetermined distance away from said base, and means for turning a button over in response to engagement of said switch lever with one of said contacts, whereby displacement of the plunger relative to the ring swings the switch lever from the first contact to the second contact to orient buttons that are inserted between the ring and the base.

9. Apparatus for orienting buttons with a preselected side facing up comprising a shelf, a locater plate overlapping said shelf, said locater plate having an opening therein for receiving a button, means for displacing a button into said opening, means for displacing said shelf away from said plate opening, an arm, means mounting said arm for swinging movement toward and away from said locater plate, a sleeve extending outwardly from said arm adjacent said plate opening, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through said opening, a switch lever on said arm, first and second contacts on said arm, said plunger being connected with said lever, means for displacing said lever into engagement with said first contact upon swinging movement of said arm a predetermined distance away from said base, first chute means for conveying a button away from said plate opening to another location with the same side up, second chute means for conveying a button away from said plate opening to said location and turning over the button, and means operating in response to said switch means for diverting a button from said plate opening to one of said first and second chute means in response to said switch means, whereby wrong side up buttons are diverted to said second chute means while right side up buttons are diverted to said first chute means.

10. Apparatus for orienting buttons with a preselected side facing up comprising a base, an arm, means mounting said arm for swinging movement toward and away from said base, a sleeve extending outwardly from said arm adjacent said base, a ring secured on said sleeve, said ring having an opening therein, a plunger in said sleeve, said plunger being movable longitudinally through the opening, a switch lever on said arm, first and second contacts on said bracket, said plunger being connected with said lever, means biasing said lever into engagement with said first contact, first chute means for conveying a button away from said plate opening to another location with the same side up, second chute means for conveying a button away from said plate opening to said location and turning over a button, a diverter bar between said chute and said base, said bar being mounted for swinging movement between alignment with said first and with said second chute means, solenoid means for swinging said diverter bar into alignment with one of said chute means, spring means biasing said diverter bar into alignment with the other of said chute means, said solenoid means being in series circuit with said contacts and said lever, whereby the relative positions of the plunger and the ring position the lever to energize the solenoid when one side of the button is facing up while the solenoid is de-energized when the opposite side is facing up and buttons are conveyed to said location with the same side facing up.

11. Apparatus for orienting buttons according to claim 10, wherein said base includes a shelf, and a locater plate overlapping said shelf, said plate having an opening therein, said shelf being mounted for swinging movement toward and away from the opening, whereby a button in said opening falls through the opening when the shelf swings away from the opening.

References Cited

UNITED STATES PATENTS

1,106,607 8/1914 Woellert ..... 221—158

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