Nov. 26, 1940. E. C. CARRIS ET AL 2,222,895

BLANK FEEDING MECHANISM

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Fig. 1.

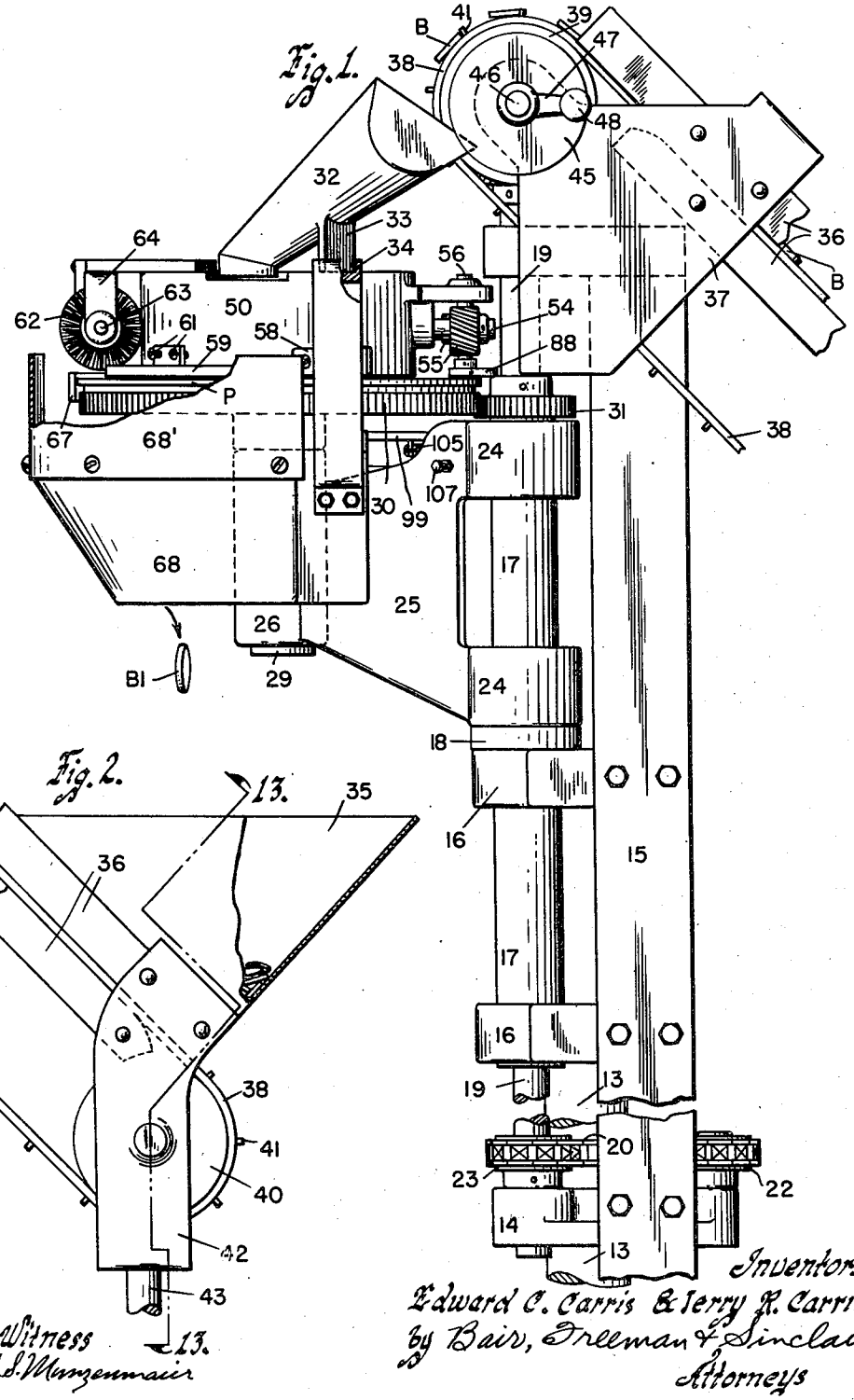


Fig. 2.

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BLANK FEEDING MECHANISM

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Fig. 3.

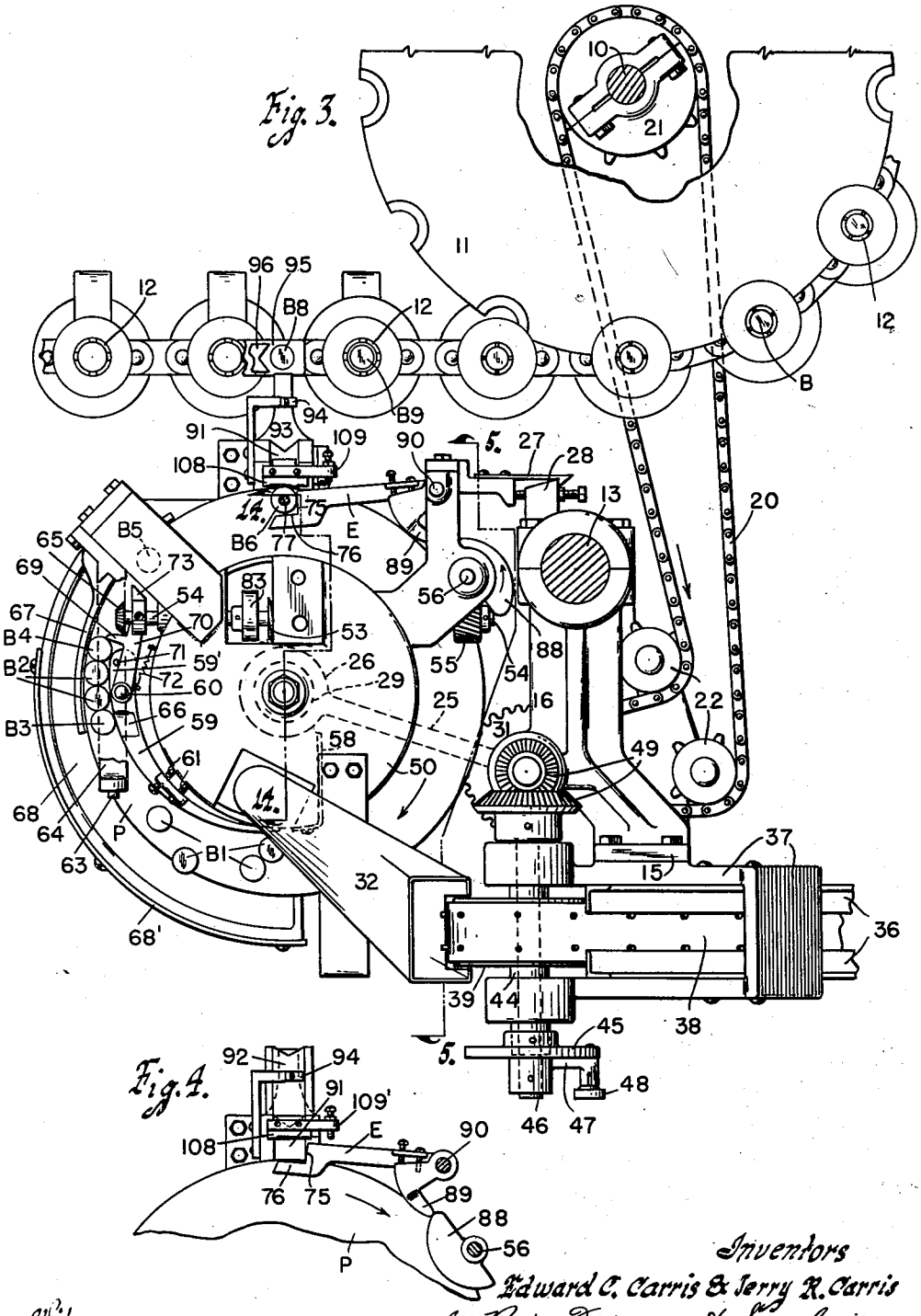


Fig. 4.

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BLANK FEEDING MECHANISM

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Fig. 7.

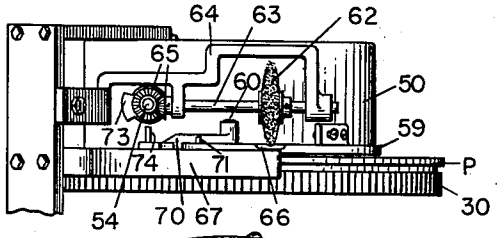


Fig. 6.

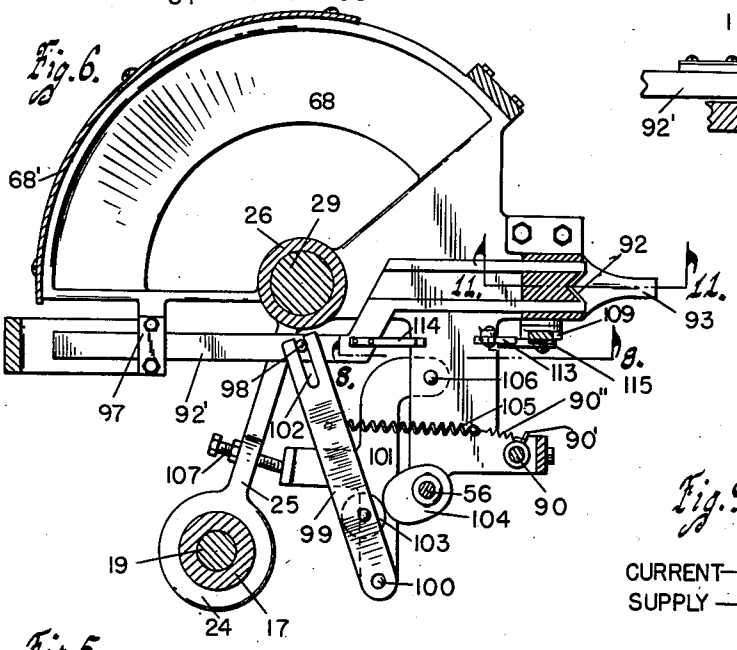


Fig. 8.

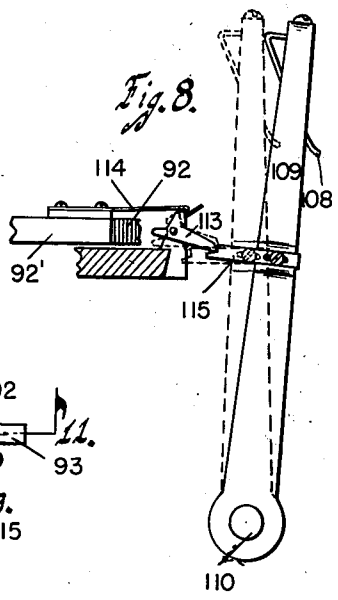


Fig. 9.

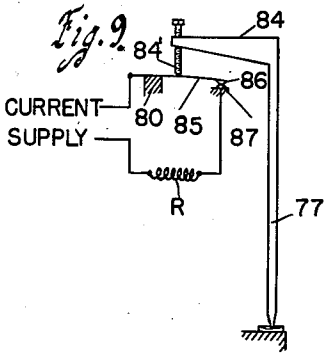


Fig. 5.

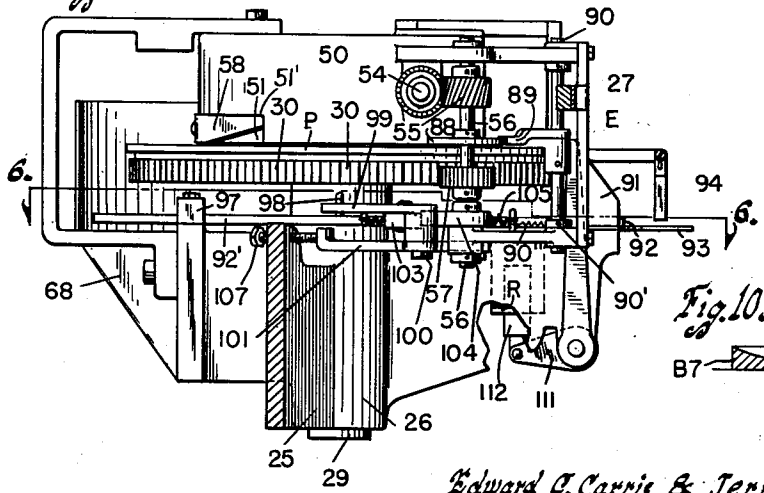


Fig. 10.

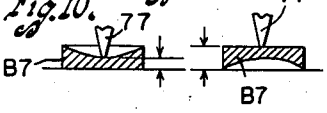


Fig. 10a.

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BLANK FEEDING MECHANISM

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Fig. 11.

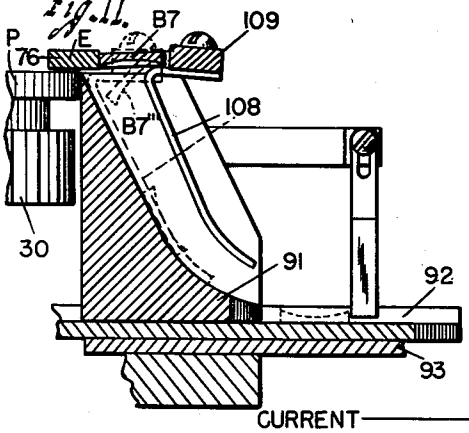


Fig. 12.

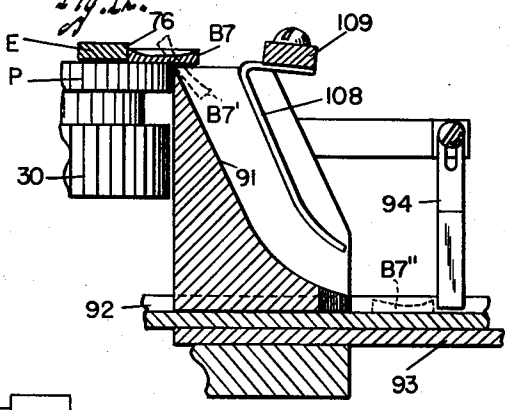


Fig. 15.

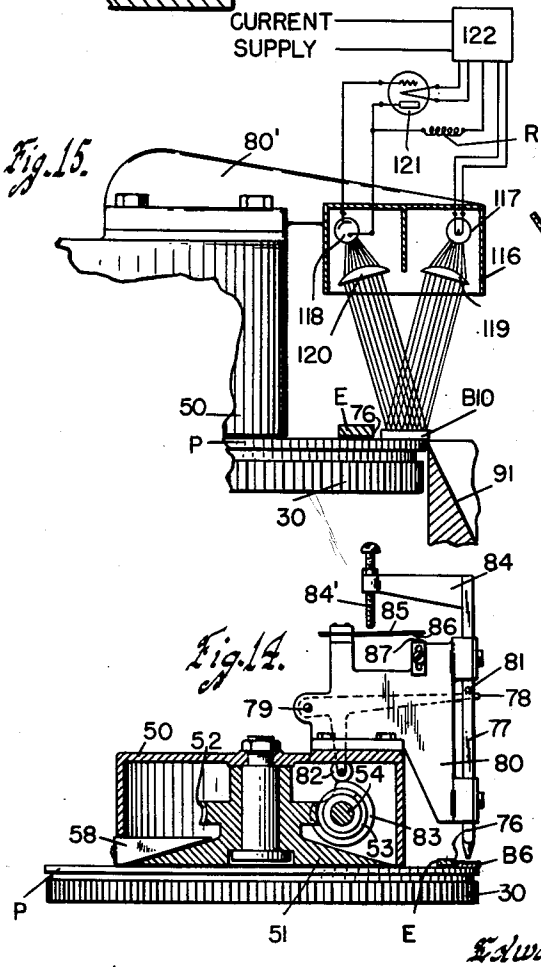
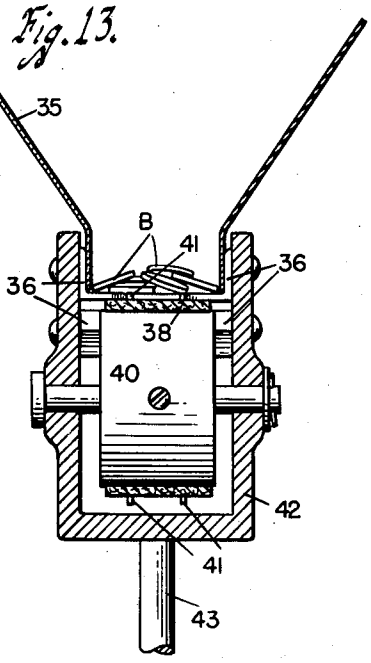


Fig. 14.

Fig. 13.



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Patented Nov. 26, 1940 2,222,895

UNITED STATES PATENT OFFICE

2,222,895

BLANK FEEDING MECHANISM

Edward C. Carris and Jerry R. Carris, Washington, Iowa, assignors to Iowa Button Machinery Company, Washington, Iowa, a corporation of Iowa

Application June 14, 1937, Serial No. 148,126

8 Claims. (Cl. 79—17)

An object of our invention is to provide blank feeding mechanism particularly adapted for feeding button blanks to a button finishing machine.

A further object is to provide a mechanism which is mechanically improved as compared with the apparatus disclosed in the Clarence P. Carris Patent Number 2,063,485, issued December 8, 1936.

A further object is to provide blank feeding mechanism including a moving plate or other surface on which the blanks are deposited from a hopper or conveyor, means being provided for separating the blanks on the plate and properly spacing them relative to each other for periodical feeding to the chucks of a button finishing machine.

A further object is to provide a mechanism associated with the moving plate operable to reverse the blank face for face if the proper face is not uppermost on the plate.

Another object is to provide a blank feeding mechanism which is timed with relation to a button finishing machine having a plurality of traveling button blank chucks so that a button blank is fed from the feeding mechanism to each chuck as it passes the feeding mechanism.

Still a further object is to provide blank feeding mechanism including a feed plate and an ejector for ejecting the blanks from the feed plate, electrically operated means being provided and cooperating with the ejecting means to either permit the blank to be ejected with its uppermost face remaining uppermost, or to reverse the blank so that the other face is uppermost, if the blank, when on the feed plate, has the wrong face uppermost.

Still a further object is to provide an interchangeable mechanism to either mechanically gauge the thickness of the blank or an electric scanning mechanism to determine which face is uppermost due to its reflecting characteristics, either of these mechanisms being operable to control a solenoid which reverses the blank face for face if necessary.

Another object is to provide a rotating plate, to the surface of which button blanks are fed from a hopper, guide means being provided for the blanks to position them at a predetermined position on the plate as it rotates.

Another object is to provide mechanism for sweeping the blanks off the plate one at a time and at properly timed intervals, so that a blank is fed to a button finishing machine at the precise time one of a series of chucks on the machine passes the blank feeding mechanism.

Another object is to provide a chute for receiving the blanks as they are swept off the revolving plate, mechanism being provided adjacent the intake end of the chute for either permitting the blank to freely fall into the chute or engaging the blanks and restricting its movement so that as it falls into the chute, it is turned face for face, automatic mechanism being provided for effecting either of the operations just mentioned as desired.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our blank feeding mechanism, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a rear elevation of a blank feeding mechanism embodying our invention.

Figure 2 is a continuation of the right hand side of Figure 1 showing the hopper which contains the blanks to be fed to the feeding mechanism.

Figure 3 is a plan view of our blank feeding mechanism showing it in association with a button finishing machine.

Figure 4 is a plan view of a portion of the blank feeding mechanism showing the parts in a different position than they are in Figure 3.

Figure 5 is a sectional view on the line 5—5 of Figure 3 showing the blank feeding mechanism in right hand elevation.

Figure 6 is a sectional view on the line 6—6 of Figure 5 showing particularly the mechanism for pushing the blank out of a feeding chute.

Figure 7 is a left hand side elevation of part of the feeding mechanism showing particularly a rotating brush for eleminating excess blanks piled on top of other blanks.

Figure 8 is a sectional view on the line 8—8 of Figure 6 showing a trip mechanism.

Figure 9 is a diagrammatical view (semi-electrical) showing the operation of the gauge mechanism which forms a part of the feeding mechanism.

Figure 10 is an enlarged detail view of the gauging mechanism in operation and cooperating with a button blank having its concave side uppermost.

Figure 10*a* is a similar view showing contact of the gauge rod with a blank having its flat face uppermost.

Figure 11 is a sectional view on the line 11—11 of Figure 6 showing a chute for receiving the button blank and showing the blank being reversed before reception.

Figure 12 is a similar view showing the blank being fed to the chute without reversing it.

Figure 13 is a sectional view on the line 13—13 of Figure 2 showing the blank hopper.

Figure 14 is a sectional view on the line 14—14 of Figure 3 showing the gauging mechanism, which mechanism is removed from Figure 3 to better show other details of construction; and

Figure 15 shows a portion of Figure 14 on an enlarged scale and illustrates a scanning mechanism substituted for the mechanical gauging mechanism in Figure 14, the electric circuit of the scanning mechanism being shown diagrammatically.

On the accompanying drawings we have used the reference numeral 10 to indicate one of the vertical driven shafts of a button drilling machine of the usual construction. Such machine includes a sprocket 11 driven by the shaft 10, and a plurality of button chucks 12 passing around the sprocket and around another one spaced therefrom (not shown).

The chucks 12 are designed for holding button blanks for any desired operation, such as drilling, fish eye cutting and the like. Such a machine usually has a supporting post indicated on the drawings at 13.

Our present mechanism, however, has to do only with a feeding means for feeding button blanks to the chucks 12. The feeding means is mounted on and operatively associated with the usual type of button finishing machine, and will now be described in detail.

A bracket 14 is secured to the post 13 and rigidly supports a vertical frame bar 15. The frame bar preferably extends to the floor (not shown) to provide a solid anchorage therefor. A pair of spaced supporting brackets 16 are secured to the frame bar 15 and rotatably support a sleeve 17 having a stop collar 18. The stop collar 18 rests against the upper supporting bracket 16.

A drive shaft 19 is journalled in the sleeve 17 and is driven by a chain 20 from a sprocket 21 on the driven shaft 10 of the button finishing machine. Suitable idlers 22 are provided so that the chain does not interfere with the supporting post 13, and on the drive shaft 19 a sprocket 23 is provided around which the chain 20 extends. The chain connection synchronizes the rotation of the shaft 19 with the rotation of the shaft 10, and consequently with the movement of the button blank chucks 12.

A supporting yoke is provided for our blank feeding mechanism. This yoke has a pair of bearings 24, a web 25 and a hub 26. The yoke is clamped to the sleeve 17 above the collar 18 and supports most of the feeding mechanism. Due to the mounting of the yoke on the sleeve, the feeding mechanism can be swung counterclockwise away from the feeding position shown in Figure 3 for adjustment or other purposes.

Normally the feeding mechanism is latched in proper feeding position with relation to the button blank chucks 12 by any suitable latch mechanism. By way of illustration, we show a spring latch 27 in Figure 3, which catches over a projection 28 extending from the supporting post 13.

Journalled in the hub 26 of the yoke is a plate supporting shaft 29. On the upper end of this shaft a plate P is secured, and it is adapted to be rotated by a ring gear 30. The ring gear 30 meshes with a drive pinion 31 (see Figures 1 and 3) which in turn is driven by the shaft 19, to which it is secured.

Button blanks are delivered to the upper surface of the feed plate P through a feed chute 32. This chute may be removably positioned on the feeding mechanism so it can be conveniently removed whenever it is desired to swing the feeding mechanism away from feeding position. For instance the chute 32 may have a supporting flange 33 extending into a socket 34 of the frame of the feeding mechanism. Button blanks B are delivered to the feed chute 32 from a hopper 35.

The hopper 35 is connected by a pair of frame bars 36 with a head member 37 secured to the upper end of the supporting bar 15. A conveyor belt 38 traverses a drive pulley 39 and an idler pulley 40 positioned respectively at the upper and lower ends of the bars 36 and 37.

This belt may be of leather or other suitable flexible material, and is provided at spaced intervals with pins or projections 41 which engage the blanks B with two point contact and carry them, one at a time, over the pulley 39 to be expelled into the feed chute 32.

The lower ends of the conveyor and the hopper 35 are supported by a frame member 42 shown in Figure 2, and a supporting post 43. This post extends to the floor for rigid support.

The drive pulley 39 is secured to a sleeve 44 (see Figure 3) to which is also secured a disk 45. This disk is adapted to be driven by a shaft 46, a clutch connected between the two being provided in the form of an arm 47 secured to the shaft and having a spring pressed pin 48 adapted to normally engage a perforation in the disk 45 to be retracted therefrom when it is desirable to stop operation of the conveyor, even though the drive shaft 19 continues to rotate. The drive shaft 19 drives the shaft 46 through a set of bevel gears indicated at 49.

The blanks B fall from the feed chute 32 into a cylindrical housing 50. Within this housing, as best shown in Figure 14, is an obtuse, cone-shaped, rotating disk 51. This disk is driven by a worm gear 52 and a worm 53 from a counter-shaft 54. The counter-shaft 54 is driven by spiral gears 55 from a vertical shaft 56. The shaft 56 in turn is driven from the ring gear 30 by a pinion 57 meshing therewith (see Figure 5).

By reference to Figure 3, it will be noted that the discharge end of the chute 32 is at one point around the periphery of the housing 50. Directly behind this point a sweep blade 58 is provided, which blade is shown as a triangular strip of metal in Figure 14. This blade sweeps the blanks B off the disc 51, through an opening 50' in the housing 50 (see Figure 5), and onto the plate P. The cone shape of the disc is a material aid in this operation. The housing 50 serves as a guard to prevent the blanks from leaving the dial, except at the opening 50'.

The disc 51 is geared to rotate faster than the plate P, so as to project the blanks onto the plate. A greater number of blanks is fed through the chute 32 to the plate P than necessary for periodic feeding to the button finishing machine, as some of them might pile up on top of others and be improperly fed. Means is provided for discarding the piled up blanks which will soon be described.

Referring to Figure 3, several blanks indicated at B^1 have been projected onto the plate P. These are shifted by a spirally arranged guard 59 to a position adjacent the periphery of the plate P by rotation of the plate in a clockwise direction. Blanks indicated at B^2 have been shifted to their proper position by the guard 59.

The guard is pivoted at 60 and may be adjusted about the pivotal connection by means of a pair of screws 61, one of which acts as a set screw to push the guard away from the housing 50, and the other of which, being threaded into

the housing, serves the purpose of holding the set screw against the housing.

The purpose for adjusting this guard is so that its trailing end indicated at 59' can be positioned in properly spaced relation to the periphery of the plate P for different sizes of button blanks. It sometimes happens that even when the blanks get to a position indicated at B^3, one is piled on top of another.

A rotating brush 62 (see Figure 7) is provided for taking care of this contingency. It is mounted on a shaft 63 supported by a bracket 64 and driven by bevel gears 65 from the countershaft 54. The guard 59 is notched as at 66 to avoid interference with the brush.

Located just outside of the periphery of the plate P is a guard rail 67 which is slightly higher than the plate, but not higher than the thickness of one blank. Accordingly, when a second blank is on top of one blank and the position B^3 is reached, the brush 62, rotating in the proper direction, sweeps the second blank over the guard rail 67 and into a spiral chute 68. These blanks may be collected in a suitable receptacle and returned to the hopper 35 by the operator of the machine.

After the blanks B^2 assume their proper position adjacent the periphery of the plate P, they are released periodically by a mechanism which will now be described.

The blank B^4 in Figure 3 is being held by a retainer element 69 which is part of an arm 70 pivoted on the pivot 60. This arm is normally held against a stop pin 71 by a spring 72. The counter shaft 54 carried an inclined cam 73, the inclination of which engages a pin 74 extending upwardly from the arm 70 (see Figure 7). The cam 73 swings the arm 70 sidewise against the tension of the spring 72, thus removing the retainer element 69 from the path of movement of the blank 54. The blanks are thus released periodically for properly spacing them to be received at the proper time in the ejecting mechanism, which will now be described.

In Figure 3 I have shown blanks B^5 and B^6 which have thus been spaced. The blank B^6 is just entering a pocket formed in an ejector arm E. The ejector arm E has a pair of shoulders 75 and 76 to form this pocket. When the blank B^6 engages the shoulder 75, due to the rotation of the feed plate P, it will remain in this position until the ejector sweeps it off the plate. While in this position, a mechanical gauge means is operated to determine whether or not the proper side of the blank is uppermost.

This gauge is shown best in Figure 14, and includes a gauge pin or feeler rod 77, the position of which is shown in Figure 1 as being at the center of the blank B^6. The gauge rod 77 is pointed at its lower end for engagement with the blank B^6. Normally this rod is held in raised position by a lever 78 pivoted at 79 to a bracket 80. The bracket 80 is removably positioned on the housing 50.

The lever 78 engages under a pin 81 extending from the rod 77, the rod causing the pin to engage the arm by gravity. The arm 78 carries a roller 82 coacting with a cam 83 on the counter-shaft 54. When the depression of the cam registers with the roller, the gauge rod 77 is permitted to lower for contact of its pointed end with the button blank. This permits the gauge rod to assume either the position of Figure 10 or the position of Figure 10*a*, depending on whether the concave side or the flat side of the blank is uppermost.

In this connection it should be mentioned that the mechanism just described is used on blanks having one face concaved, such as those formed from shells, the concavity being due to the inner curvature of the shell from which the blank is made, or which may be produced mechanically if desired, this being the surface desired uppermost when the blank is in the chuck 12 of the button finishing machine. The other side of the blank is ground flat before the blanks are placed in the hopper 35 so that they will rest properly in the chuck 12 and will lie flat on the plate P.

When the flat side of the blank is uppermost, as shown in Figure 10*a*, an extension 84 of the gauge or feeler rod 77 either comes close to a contact spring 85 or engages it, but does not cause a contact 86 carried thereby to engage a stationary contact 87.

When the concave side of the blank is uppermost, however, as shown in Figure 10, the contacts 86 and 87 will be engaged for energizing a relay R (see Figures 5 and 9), the purpose of which will hereinafter be described.

The extension 84 may carry an adjusting screw 84' for adjustment to accommodate various thicknesses of button blanks, and preferably engages the leaf spring 85 adjacent the anchorage point thereof to multiply the motion of its contact carrying end.

For operating the ejector E we provide a cam 88 secured to the vertical shaft 56. This cam engages an adjustable extension 89 of the ejector arm for swinging it from the position shown in Figure 3 to the position shown in Figure 4.

The ejector arm E is secured to a vertical pivoted rod 90, the lower end of which has a pin 90' extending therefrom as shown in Figure 6. A spring 90'' is connected with the pin 90 for normally swinging the ejector arm E in a counter-clockwise direction as viewed in Figure 4, for retaining the extension 89 in engagement with the cam 88.

In Figure 12 a position of the ejector E intermediate the two positions just mentioned is indicated. The shoulder 76 of the ejector is sweeping a blank B^7 off the edge of the feed plate P into an ejector chute 91. The blank slides down the chute as indicated at $B^{7'}$ and assumes a position $B^{7''}$ on the web of a channel shaped transfer push bar 92.

The flanges of the bar 92 position the blank $B^{7''}$ centrally relative to an ejector plate 93 and a swinging stop 94 prevents excessive movement of the blank after it leaves the ejector chute 91.

On the return stroke of the transfer push bar 92, the blank $B^{7''}$ drops down onto the ejector plate 93 and on the next forward stroke of the push bar 92, the blank is pushed off the plate 93 and onto a chucker plate 95 (see Figure 3). The blank in this position is indicated as B^8. The chucker plate forms no part of our present invention, but forms the subject matter of our co-pending application filed June 14, 1937, Serial Number 148,127, now Patent No. 2,187,266, dated Jan. 16, 1940, and includes a push bar 96 for pushing the blank B^8 off the chucker plate 95 and into the button blank chuck 12 as indicated at B^9.

All the parts are synchronized, of course, so that as each chuck 12 passes the chucker plate 95, a button blank is pushed into it by the push bar 96.

For reciprocating the transfer push bar we provide mechanism which is best shown in Figure 6. The push bar itself is slidable between the lower end of the ejector chute 91 and the ejector plate 93. The bar 92 has an offset portion 92' slidable in a guide 97. The portion 92' is provided with a pin 98 with which an arm 99 coacts. The arm 99 is pivoted at 100 to a bracket 101 and is provided with a slot 102 receiving the pin 98.

The arm 99 carries a roller 103 coacting with a cam 104. The cam 104 is secured to the vertical shaft 56 and the roller 103 is retained in engagement with the cam 104 by a spring 105.

Means is provided for adjusting the throw of the transfer push bar 92 comprising a pivotal connection 106 for the supporting bracket 101 and an adjusting screw 107 threaded through the web 25 of the supporting yoke for the feeding mechanism. The spring 105 tends (by pulling in a right hand direction) to rotate the arm 99 about the roller 103 as a pivot and therefore tends to rotate the bracket 101 in a clockwise direction and retain it against the set screw 107.

The transfer push bar actuating mechanism is so arranged that if anything occurs to hinder the action of the transfer push bar, the spring 105 will not push it forwardly, but the shaft 56 and the cam 104 can continue to rotate. This prevents any breakage of the parts if broken pieces of the button blanks jam the guideways and thus prevent free sliding movement of the transfer push bar 92.

The foregoing description of the ejecting operation is for a blank which is not to be turned over, and assumes that a chute guard 108 as shown in Figure 12 is out of the way so the blank is free to slide down the ejector chute 91. The chute guard 108 is carried by an arm 109 mounted on a pivot shaft 110 (see Figures 5 and 8).

A second arm 111 extends from the shaft 110 and has attached thereto a solenoid core 112. This core is adapted for being attracted by the solenoid coil of the relay R whenever it is energized. The weight of the core normally retains the chute guard 108 in the position shown in Figure 1, which position is shown by dotted lines in Figures 8 and 11.

When the gauge rod 77 assumes the position shown in Figure 10, due to the concave side of the blank B^7 being uppermost, the contacts 86 and 87 are closed as illustrated in Figure 9, thus energizing the relay and causing the arm 109 to swing to the position shown in Figures 4 and 12 and by solid lines in Figure 8. Thereafter the notch of the cam 83 passes the roller 82 of the arm 78, and the lobe of the cam raises the gauge rod to the position of Figure 14 to separate the contacts 86 and 87 from each other, thereby deenergizing the relay.

The arm 109, however, is now retained in its full line position of Figure 8 by a pivoted latch 113. This insures, during the ejecting operation of the ejector E, that the blank B^7 will tip off the edge of the feed plate P and go down the ejector chute 91, concave face upward, as illustrated in Figure 12.

After the blank has entered the chute, the push rod 92 will be retracted, and during the retracting operation, a spring catch 114, carried by the portion 92' of the push bar, will engage the latch 113 to tip it to the dotted position illustrated in Figure 8.

By this time, the inclination of the portion of the latch 113 with which the spring catch 114 engages is such that the spring catch 114 will readily slip off the latch and allow it to return by gravity to its initial position for subsequent coaction with the projection 115 of the arm 109. This projection is adjustable relative to the arm for predetermining the position of the arm when held in latched position by the latch 113.

If the blank is flat face uppermost, however, as shown in Figure 10*a*, the contacts 86 and 87 are not engaged so that the chute guard 108 is not moved outwardly in the manner just described. Therefore the outer edge of the blank B^7 (see Figure 11) will first move to a position supported on the upper end of the chute guard 108, whereupon the ejector arm E engages a set screw 109' of the arm 109 to swing the arm outwardly just before the outer edge of the blank B^7 engages the arm. The set screw, of course, can be adjusted for different sizes of button blanks.

As soon as the inner edge of the blank B^7 has been swept off the plate P, this edge will drop, thus releasing the blank as at $B^{7'''}$, thus causing it to turn over before striking the chute 91.

In this manner, the blank which was concave face downward slides down the chute 91 and lands on the push bar 92 concave face uppermost.

During the return movement of the ejector arm E to its initial position, the arm 109 will have been latched by the latch 113 in the manner already described so as to keep the chute guard 108 from prematurely moving back to its initial position and catching the blank B_7''' as it slides down the chute.

Thus we provide a mechanical means for gauging the blanks and for reversing them face for face when one face is concave and the other flat, and the wrong face is uppermost.

Some blanks, however, are flat on both faces, but have different light reflecting characteristics. For instance, one face may be polished and the other one unpolished. A polished surface will reflect more light than an unpolished surface.

To provide in a blank feeding mechanism a means for reversing such blanks face for face when necessary, we substitute a scanning mechanism somewhat of the character of that shown in the Carris patent hereinbefore referred to, for the mechanical gauging mechanism shown in Figure 14, and referred to by the reference numerals 77 to 87.

The scanning mechanism is shown in Figure 15 and includes a bracket 80' supported in place of the bracket 80, which bracket has secured thereto a housing 116. The housing 116 is provided with a source of light such as an electric light bulb 117 and a light sensitive cell or vacuum tube 118.

Light from the light source 117 passes through a condensing lens 119 to the upper surface of the blank indicated at B^9, and is reflected through a lens 120 to the light sensitive tube 118. The usual type of amplifier bulb 121 and the power pack 122 as generally known in connection with radio circuits is used for amplifying the current controlled by the light sensitive tube 118, and for energizing the relay coil R for thus opening the chute guard 108, as in Figure 12, whenever the polished side of the blank is uppermost. When the unpolished side is uppermost, the relay will not be energized and the blank will be reversed face to face as in Figure 11.

It is thus possible to reverse the blanks face for face whether the distinguishing characteristic between the faces is in their light reflecting properties or in their relative contours.

Various changes of course may be made in the construction and arrangement of the parts of our blank feeding mechanism without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim as our invention:

1. In a blank feeding mechanism, a movable horizontal feed plate, means for depositing blanks at random thereon, guard means for shifting the blanks horizontally into alignment thereon as said feed plate moves, a retainer element for temporarily holding the blanks and releasing them one by one in spaced relation on the feed plate, means for periodically sweeping each blank off the feed plate for feeding it to a machine to perform operations on the blank, and means for gauging each blank and reversing it face for face if required in accordance with the operation of said gauging means.

2. In a blank feeding mechanism, a movable feed plate, means for depositing blanks at random thereon, a temporary retaining element for spacing the blanks at predetermined intervals from each other on the feed plate, an ejector for periodically sweeping each blank from the feed plate to a machine to perform operations on the blanks, a chucker plate for receiving each blank, means for gauging the blanks, and means for reversing them if required before positioning on the chucker plate in response to the gauging means, said last means including a relay operating device which permits normal sweeping of the blank from the feed plate when the relay is operable and engages the blank to reverse it if the relay remains inoperable.

3. In a blank feeding mechanism, a movable feed plate, means for depositing blanks thereon at random, a temporary retainer for spacing the blanks uniformly on the feed plate, an ejector for periodically sweeping the blanks off the feed plate for feeding them to a machine to perform operations on the blank, a chucker plate for receiving each blank, and means for scanning the blanks and reversing them face for face if required in accordance with the scanning means before positioning on said chucker plate.

4. In a device of the class described, a rotary feed plate, means for depositing blanks thereon, an ejector for periodically sweeping each blank individually off the feed plate in one direction for feeding them to a machine for performing operations on the blanks, a chucker plate for receiving each blank, and gauge means to engage the blanks before they are swept off the feed plate, said last means comprising a gauge element, means for normally retaining said element spaced from the plate and for moving it toward the feed plate when a blank is in alinement therewith, contacts engaged by movement of said gauge element if such movement exceeds a predetermined amount, a relay rendered operable by engagement of said contacts, and means operated by the relay to modify the movement of the blank as it is swept from the feed plate to the chucker plate.

5. In a device of the class described, a movable feed plate, means for depositing blanks thereon, comprising a rotating obtuse cone-shaped disc, a guard around the periphery of said disc, means for depositing blanks at random on said disc, and a sweep blade extending onto the disc for sweeping blanks edgewise therefrom, said guard having an opening with a vertical dimension less than the diameter of said blanks adjacent said sweep blade to permit such sweeping of the blanks from the disc in horizontal position, means adjacent said plate for directing the blanks thereon to follow a predetermined path on the plate, means for periodically releasing the blanks successively from said path, an ejector for periodically sweeping the released blanks off the plate, and a chute receiving the blanks therefrom and feeding them to a machine for performing operations thereon.

6. In blank feeding mechanism of the character disclosed, a feed plate, means for depositing blanks in position therein, temporary retaining means actuable at equally spaced intervals for spacing said blanks on said feed plate, an ejector timed to operate at equal intervals synchronized with the spacing of said blanks for periodically sweeping each blank off the feed plate for feeding them to a machine to perform operations on the blanks, and means for scanning the blanks and reversing them face for face if required in accordance with the scanning means.

7. In a blank feeding mechanism cooperable with a machine for processing said blanks, a feed plate, means for depositing blanks in position at predetermined equal intervals thereon, a chute forming a single continuous passage for feeding the blanks from the plate to said machine, means for periodically sweeping each said blank directly from its position and into said chute, a chute guard positioned in said chute, gauge means effective at a predetermined position with respect to said feed plate cooperating with each blank prior to its being swept from said position and operable to shift said chute guard into position for engagement with one side of each said blank adjacent a point at an edge thereof and adapted thereby when said blank is in one face-up position to temporarily interrupt the progress of said edge and reverse the position of the blank upon its passage through the chute, said gauge means being inoperable to shift the guard when said blank is in another face-up position.

8. In a blank feeding mechanism, a blank support and means adjacent said support for depositing all blanks received in the machine in a path at equal predetermined intervals on said support, a single chute forming a single continuous passage leading from said path to an auxiliary machine for feeding each said blank successively to a single conveyor for said machine to perform operations on the blanks, a single sweeping means for periodically sweeping each said blank successively from its position in the path into said chute, an inverting chute guard positioned to partially interrupt the passage formed by said chute, gauge means adjacent the chute for scanning each blank prior to its being swept from said position into said chute and connecting means between said gauge means and said chute guard, said gauge being responsive to the light reflecting characteristic of the blanks to control the inverting operation of said chute guard.

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