W. F. NILES.

Button-Polishing Machine.

No. 207,889. Patented Sept. 10, 1878.

FIG. 1.

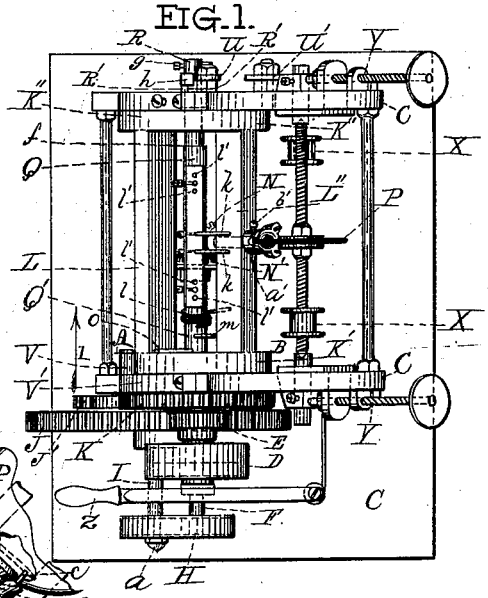


FIG. 4.

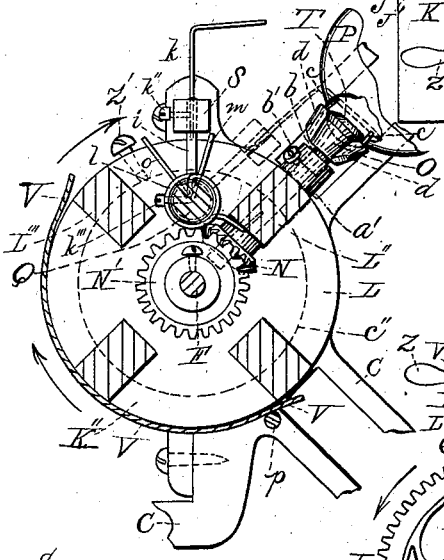


FIG. 2.

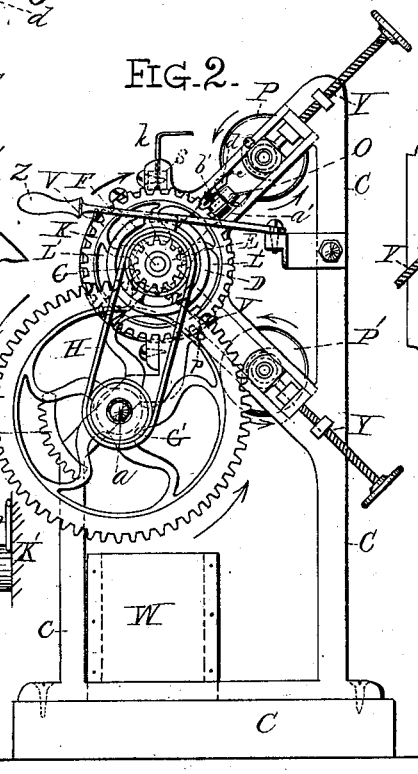


FIG. 3.

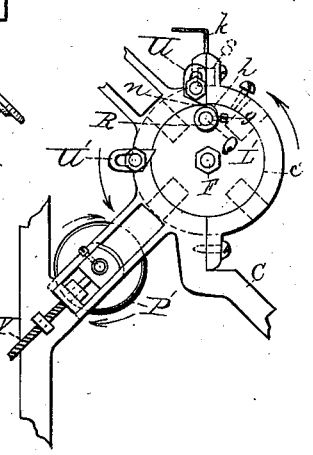


FIG. 5.

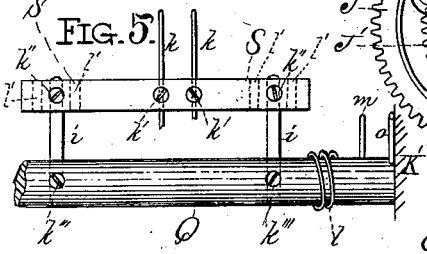
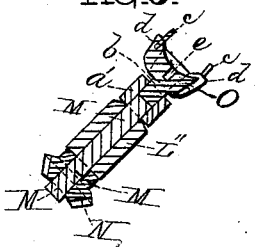


FIG. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM F. NILES, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BUTTON-POLISHING MACHINES.

Specification forming part of Letters Patent No. **207,889**, dated September 10, 1878; application filed June 24, 1878.

To all whom it may concern:

Be it known that I, WILLIAM F. NILES, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Button-Polishing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a top or plan view of so much of a button-polishing machine as is necessary to illustrate my present invention. Fig. 2 represents a side or end view of the same, looking in the direction of arrow 1, Fig. 1. Fig. 3 represents an opposite side or end view from that shown in Fig. 2 of a portion of the machine which will be hereinafter more fully described. Fig. 4 represents, upon an enlarged scale, a portion of the machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 1 of the same figure; and Figs. 5 and 6 represent, also upon an enlarged scale, a front view and section, respectively, of portions of the machine, as will be hereinafter more fully described.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

My invention relates to additional and important improvements upon the button-polishing machine for which Letters Patent No. 202,369, dated April 16, 1878, were granted to me.

The nature of said improvements consists, first, in a rotating adjustable button-support, the top of which is made to conform to the shape of the back of the button placed upon it, and provided with laterally-holding pins, as hereinafter described; second, in the combination, with the rotating button-supporting reel and button-supports, of an automatic button-holding device provided with holding-fingers, by means of which the buttons are held in place during a portion of their revolution, and then allowed to drop into the receiving box or receptacle, as will be hereinafter more fully explained; third, in the combination, with the automatic button holding and discharging device above mentioned, of the mechanism necessary for operating said device, as hereinafter described.

In the drawings, the parts marked C represent the frame-work of the machine; D, the main driving-pulley, to which is secured a small cog-gear, E, both being loosely fitted upon a horizontal shaft, F. Upon the end of said shaft F is secured a pulley, G, and by means of a belt, H, connection is made with a pulley, G′, secured upon the end of a hollow shaft, I, which turns upon a stationary shaft or spindle secured to frame C, said hollow shaft being kept from slipping off its spindle and out of position by means of a nut, *a*. Upon hollow shaft I is also secured a large cog-gear, J, which takes into cog-gear E. Thus it will be seen from the foregoing description that by this arrangement shaft F, upon which pulley G is secured, may be rotated faster or slower than gears E and J, as desired, its velocity being governed by the diameter of pulleys G and G′.

Upon two arms of cog-gear J is secured a section or segment, J′, of a gear so arranged as to take into and turn a gear, K, (loosely fitted upon shaft F and secured to the hub L′ of button-supporting reel L, said turned-down portion or hub L′ being shown, as it appears upon the opposite end of the reel, by full line *c*′, Fig. 3, and by dotted line *c*″, Fig. 4, of the drawings,) as gear J rotates, thereby turning reel L one-quarter of a revolution, the section of gearing J′ being arranged to turn it that distance. It will therefore be seen that button-supporting reel L and its cog-gear K remain stationary three-fourths of the time required for gear J to make one revolution, while at the same time shaft F is in constant motion, the purpose of which will be hereinafter stated.

A short shaft, M, (see Fig. 6,) is arranged and fitted to turn in one of the arms L″ of reel L, upon the inner end of which is secured a bevel-gear, N, which takes into a corresponding bevel-gear, N′, secured upon shaft F, thus imparting driving-power to said shaft M from shaft F.

Upon the outer end of said shaft M is formed or secured a hub, *a*′, which bears upon the face of arm L″ of reel L, and by means of which and bevel-gear N it is kept from slip-

ping out of position. A socket or hole is also formed in said hub *a'* for the reception of the circular stem or projection *b* of button-support O, which is secured in position by means of a set-screw, *b'*.

The top of button-support O may be made circular in form, as represented in Fig. 6 of the drawings, or in any other form necessary to conform to the shape of the back of the button. It may also be made of different sizes, said form and size being governed by the size and shape of the button desired to be polished upon it.

The button is kept from moving out of position laterally by means of holding-pins *c*, secured in flanges *d* projecting from the sides of the button-support. Said pins *c* are secured in flanges *d*, with their outer ends converging slightly toward the center or axis of the button-support, as shown in Figs. 4 and 6, for the purpose of more securely guarding against the button dropping out of its support.

A slot, *e*, is cut or formed in the center of the concavity upon the top of the button-support, for the purpose of receiving the eyelet upon a button so formed.

In polishing an eyelet-button pins *c* may be dispensed with, as the eyelet placed in slot *e* is quite sufficient to retain the button in place, and by removing said pins *c* the surface of the button is much better polished. When one set of pins *c* become worn down too short by usage they may be removed, and new ones applied in their place.

The button is not only revolved by the turning of the button-support O, as before explained, but is also turned by the action of the polishing or buffing wheels upon the same in the operation of polishing, the holding-pins *c* being secured in the button-support a sufficient distance apart to allow of the free turning of the button in its receptacle. If such a provision were not made, and the button fitted tightly between pins *c*, so that it could not be easily turned by the pressure of the buffing-wheels upon it, as above stated, that portion of the face of the button coming upon the side of the pins opposite from the buffing-wheel would be but partially polished, whereas by this provision above referred to the button is nicely and evenly polished on all sides.

The button being loosely fitted in its receptacle, as above stated, is also of especial advantage when the holding-fingers *k* are allowed to remain down during the operation of polishing, as hereinafter described, for the same reasons before alluded to.

In polishing an eyelet-button the independent rotating motion given to the button by the polishing-wheels, as last before mentioned, is not required, as the rotary motion given to the button by the automatic rotating button-support is sufficient to properly polish the surface of the button when adjustable holding-pins *c* are removed, as before stated.

The button placed in the button-support O is kept from falling out of the same when in an inclined or inverted position, while neither of the polishing or buffing wheels P P' is bearing against it, by means of an automatic holding device, constructed and operating as follows: A shaft, Q, is arranged and fitted to turn in the heads of reel L, the end Q' being inserted into head K' just sufficient to obtain a good bearing, while the opposite end of the shaft is turned down, as shown at *f*, and passed through the head K'' of reel L. It is also turned down still smaller, so as to form a shoulder about midway between shoulder *f* and the end of the shaft, and said shoulder bears against the inner end of a screw-pipe bearing, hereinafter mentioned, by means of which the shaft is kept in its proper position. A hub, R, is arranged upon the end of shaft Q, and is secured in this instance by means of a set-screw, *g*. Said hub R is provided with a tooth or projection, *h*, for the purpose hereinafter stated.

In order to enable shaft Q to be removed in a quick and convenient manner, the bearing of the end which supports hub R turns in a screw-pipe bearing, the head R' of which is formed in the shape of a nut, so that said screw-pipe bearing can be screwed in and out of the head K'' very quickly and conveniently whenever hub R is removed. Said removal can be performed after the removal of hub R and the screw-pipe bearing by passing the end of the shaft through the bearing in the head K'' of reel L up to the point *f*, or far enough in that direction to remove the other end, Q', out of its bearing K', and then drawing the shaft back and out of the machine.

A horizontal bar, S, is supported upon two or more supporting-pins, *i*, which are secured in shaft Q; and two holding-fingers, *k k*, are so formed, arranged, and secured upon cross or horizontal bar S that when they are sprung down over the button-support, as hereinafter described, the button will be held in position.

The supporting-pins *i i* are so arranged that they can be adjusted in shaft Q and also in the horizontal bar S, they passing through both, and are held in position by set-screws.

Holding-fingers *k k* are sprung down over the top of the button-support by means of a spiral spring *l*, one end being secured to shaft Q, and the other end to the inner side of arm L'' of reel L; and to prevent their springing forward too far, a stop-pin, *m*, is provided, which regulates the throw of the device, since it strikes against its arm L'' when holder bar or arm S is released and springs forward.

Holding-fingers *k k* may be adjusted to buttons differing in thickness by means of either set of adjusting-screws *k'*, *k''*, or *k'''*.

Holding-bar S is provided with four extra holes, *l'*, one at each side of supporting-pins *i i*, by means of which said bar may be adjusted so as to bring either one of the holding-fingers *k* directly over the center of the button. In some cases the shape of the back of the but-

ton renders it necessary to use but one button-holding finger instead of two, as herein shown and described, therefore necessitating such adjustment.

Although but one set of polishing or buffing wheels, holding-fingers, and but one button-support are herein shown and described, it will be understood that in practice each arm L″ of the reel is to be provided with one of these button-supporting devices O and two holding-fingers, *k k*, on a line with each set of polishing-wheels P P′, and any number of such sets desired may be arranged in the machine which the width thereof will permit, thus enabling several sets or series of buttons to be polished at the same time.

In the drawings, button-support O is represented in position to receive the action of the first polishing or buffing wheel P upon the button T, placed upon it, (see Fig. 4 of the drawings,) and the button-holding device elevated, being held in that position by the pointed end *n* of an adjustable dog, U, secured to the side of frame C, catching into tooth or projection *h* upon hub R. As the section of gearing J′ is at this point out of mesh with gear K, secured upon reel L, the latter is therefore stationary, while at the same time the button-support is being slowly rotated as the button is being polished; but as soon as the section of gearing J′ has arrived at the point at which it again takes into gear K, reel L is then rotated in the direction shown by arrows, Fig. 4, until the button-support and button arrive in position to receive the action of the second polishing-wheel, P′. At the same time, or just previous to the button passing out of the action of polishing-wheel P, or, in other words, before a downward and outward force is produced upon the button by the polishing-wheel, so as to throw it out of its receptacle, point *n* of dog U passes out of the notch formed by tooth or projection *h*, and allows the button-holding device to spring forward with the holding-fingers *k k* over the button, as represented by dotted lines in Fig. 4, thereby holding it in position. Fingers *k k* remain down over the button until just before it reaches the proper point to receive the action of the second polishing-wheel, P′, when the point of a second dog, U′, similar to dog U, catches into the notch formed by tooth or projection *h*, before explained, and throws the fingers up again off the top of the button; and by the time the fingers are raised to the proper height the button-support and button have arrived at the proper point to be acted upon by said polishing-wheel P′, and there stops till the section of gearing J′ again takes into gear K, when the holding-fingers are again sprung over the button, as before explained, and continue to rotate in that condition until a pin, *o*, secured in shaft Q, comes in contact with a guide-plate, V, secured at the point V′ upon the frame-work C, and at the other end by bearing against a pin, *p*, secured also in frame C, when fingers *k k* are then raised off the button, and allow it to drop into the receiving-box or receptacle W, placed in a proper position under the polishing device to receive the buttons after they have been finished. The reel L continues to revolve, with the fingers raised off the button-support, stops at the end of the next quarter of a revolution, then continues on until it arrives at the point where arm L‴ is represented in the drawings, and stops. Another button is then placed upon the button-support O, after which it passes on until pin *o* passes out of the action of guide-plate V, and allows the fingers *k k* to be sprung forward again over the top of the button, where they are retained until the button-support and button arrive at the point at which they are again thrown up by dog U striking tooth *h*, and preparatory to receiving the action of polishing-wheel P, as before stated. The operation hereinbefore described is then repeated.

When it is necessary to hold the button upon its support, not only when out of the action of the polishing or buffing wheels, but also when being acted upon by them, the holding-fingers *k k* may be allowed to remain down over the button by simply adjusting dogs U and U′ so as to not catch into the notch formed by tooth *h* upon hub R. Such adjustment becomes necessary when the polishing-wheels are rough, as is the case when they are first applied to the machine. In this case, the button being loosely fitted between the holding-pins *c*, as before stated, the action of the automatic rotating button-support and polishing or buffing wheels will be quite sufficient to rotate the button so that its face side will be completely and perfectly polished, even though the fingers remain down during the operation of polishing the button.

X X are driving-pulleys, by means of which, through belts connected with the main driving-power, power is imparted to polishing or buffing wheels P P′.

Y Y are adjusting devices, by means of which the polishing or buffing wheels are adjusted to the buttons being polished, as the former become worn down by usage, and are constructed substantially as shown and described in my patent before alluded to.

Z is a lever, by means of which pulley D and its cog-gear E may be slid to the right or left on shaft F, for the purpose of connecting or disconnecting the driving-power to or from the machine, as the case may be.

Z′ is a screw which passes through frame-work C and presses upon a piece of leather bearing against the hub of reel L, and acts as a friction-brake upon the same. Any other friction device may be substituted, if preferred, the object being to produce a slight friction upon reel L.

From the foregoing description it will be seen that my present machine is a very simple, compact, and comparatively inexpensive one, and that by its use buttons can be polished with great rapidity, and in many respects in a cheaper and more expeditious manner

than in my original patented machine, upon which this, as before stated, is an improvement.

Having described my improvements in button-polishing machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The button support or holder O, provided with a recess, *e*, and a concavity to receive the back of the button, substantially as shown and described.

2. The combination, with the button support or holder O, provided with flanges *d*, of pins *c*, substantially as shown and described.

3. The combination, with button support or holder O, of button-holding fingers *k k*, substantially as and for the purposes set forth.

4. The combination, with shaft Q, of the adjustable cross or horizontal bar S, substantially as and for the purposes set forth.

5. The combination, with shaft Q and guide-plate V, of springs *m* and *o*, substantially as and for the purposes set forth.

6. The combination, with shaft Q and hub L′, of pipe-bearing R′ and hub R, substantially as and for the purposes set forth.

7. The combination, with shaft Q, of button-holding finger or fingers *k*, dog U, and tooth or projection *h*, substantially as and for the purposes set forth.

8. The combination, in a button-polishing machine, of button-holding fingers *k*, secured to shaft Q and dogs U U′, and tooth or projection *h*, substantially as and for the purposes set forth.

9. The combination, in a button-polishing machine, of the following elements, viz: first, a concave button-holder; second, button-holding fingers; and, third, mechanism for automatically operating the button-holding fingers to hold the button while it is passing to and from the polishing or buffing wheels, and then discharging the same into the button-receptacle, substantially as shown and described.

Signed this 21st day of June, A. D. 1878.

WILLIAM F. NILES.

Witnesses:
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CHAS. WAHLERS.