No. 746,407. PATENTED DEC. 8, 1903.

S. THYBERG & A. C. L. CHAPMAN.

MACHINE FOR FILLING CHARACTER DEPRESSIONS IN BUTTONS.

APPLICATION FILED APR. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1

Fig. 2.

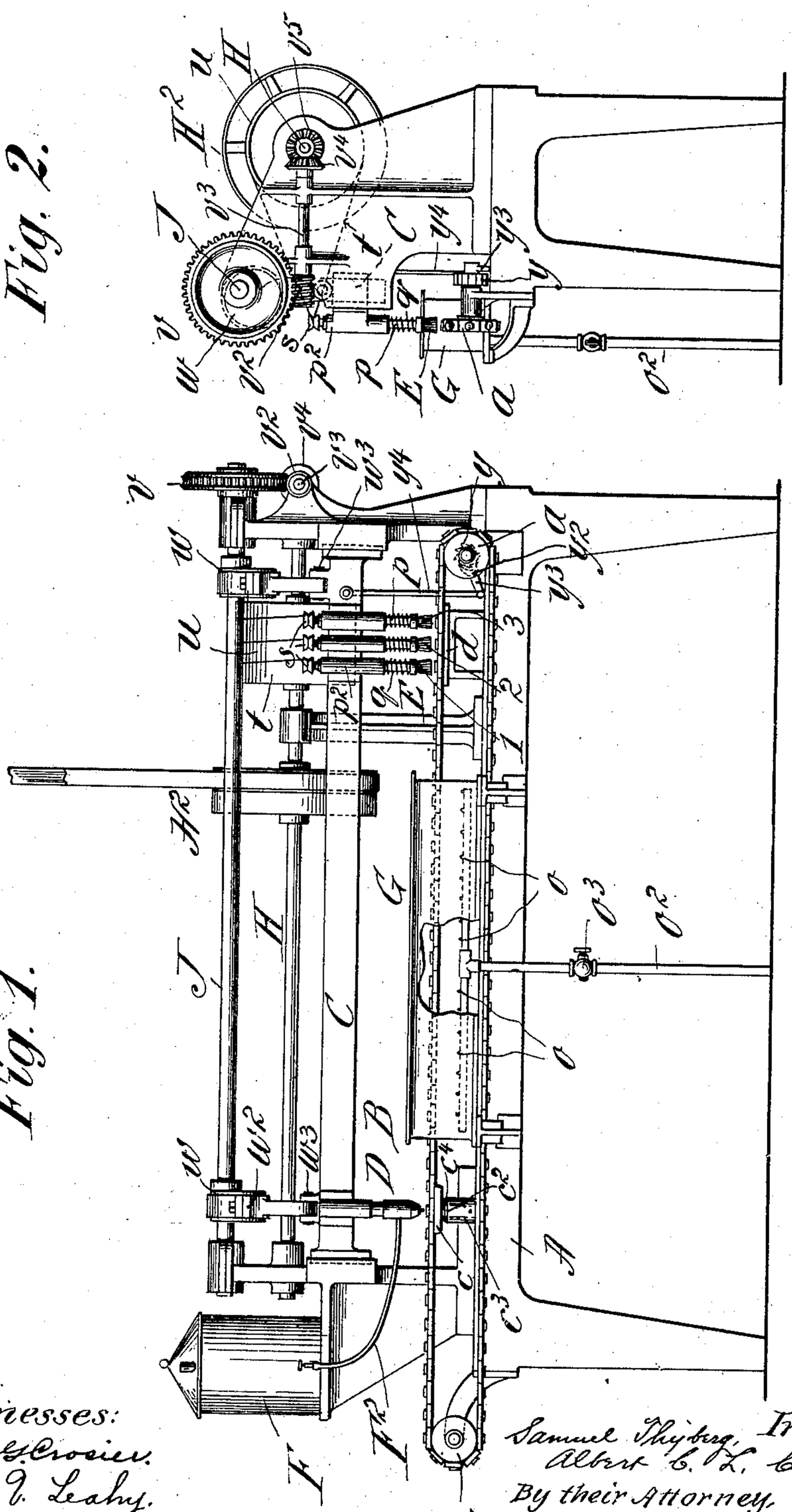

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

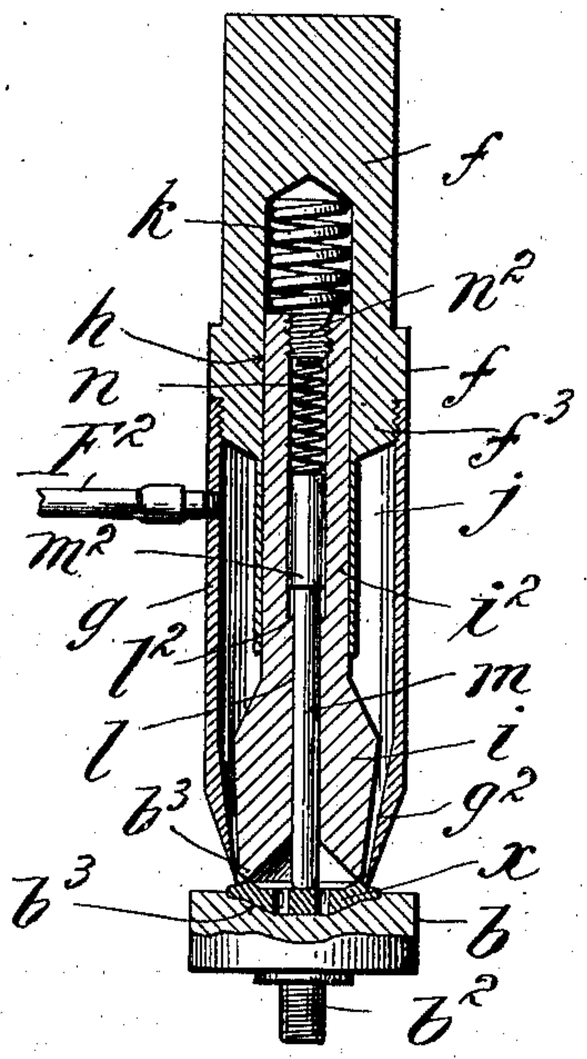


Fig. 4.

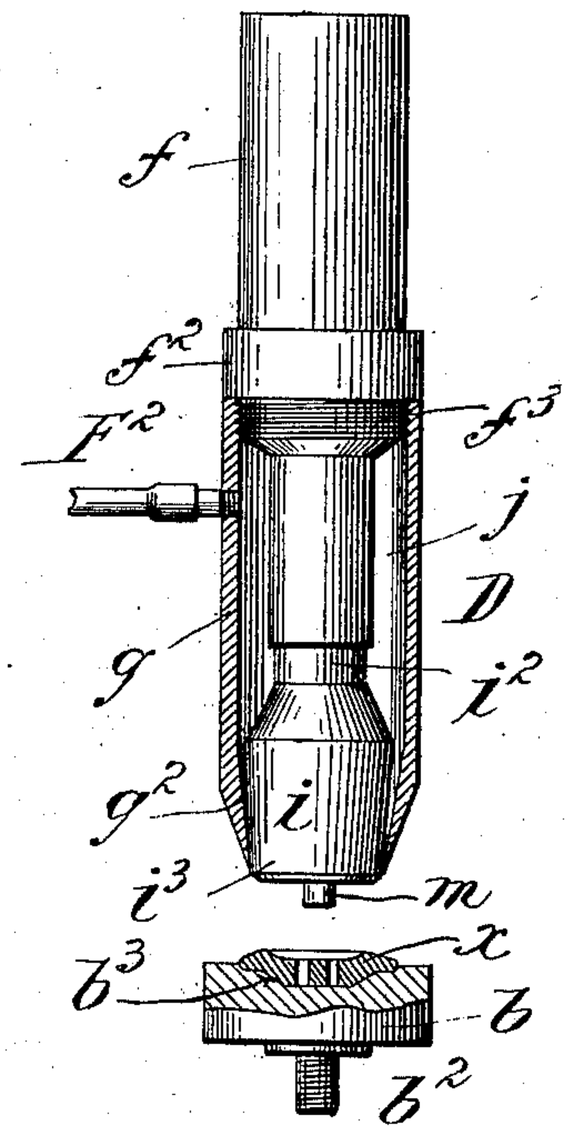
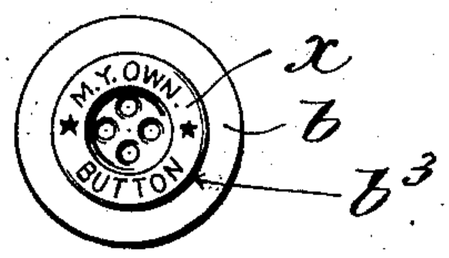


Fig. 5.



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No. 746,407. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL THYBERG, OF SPRINGFIELD, AND ALBERT C. L. CHAPMAN, OF EASTHAMPTON, MASSACHUSETTS.

MACHINE FOR FILLING CHARACTER DEPRESSIONS IN BUTTONS.

SPECIFICATION forming part of Letters Patent No. 746,407, dated December 8, 1903.

Application filed April 13, 1903. Serial No. 152,467. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL THYBERG, a resident of Springfield, in the county of Hampden, and ALBERT C. L. CHAPMAN, a resident of Easthampton, in the county of Hampshire, State of Massachusetts, citizens of the United States of America, have invented certain Improvements in Machines for Filling Character Depressions in Buttons, of which the following is a full, clear, and exact description.

This invention relates to a machine for automatically applying enamel to engraved buttons. As these buttons are generally made, the face of the button has letters, characters, designs, or configurations therein, and the enamel—for instance, white enamel—is applied on the face of the button, the substance composing which is usually black, such enamel filling in in the letter depressions or engraving. The enamel is then partially dried or permitted to set, and by a wiping action with a brush or pad the surplus of the enamel is removed, leaving the enamel-filled letter depressions to appear in a contrasting color from that of the button, and the enamel-applying and the enamel-surplus-removing actions have usually been performed by hand.

The present invention has for its object to provide an automatically-operating machine comprising a series of socketed chain-blocks or a progressive carrier for buttons and means for imparting intermittently a progressive movement thereto, a font or enamel-applying device mounted on a reciprocatory support therefor, such device having an automatically-operating shut-off to be normally closed, but to be opened for the delivery of enamel onto the face of the button when such device is brought to contact thereagainst, and such enamel-delivering device having as an equipment thereof an ejector or shedder whereby on the withdrawal of such device away from the button onto which it had come to contact at the time of delivery of the small quantity of enamel any tendency of the button to adhere to and move with the enamel-applying device, whereby the button would be withdrawn from the socket therefor in its carrier, will be avoided, such machine further comprising an oven or appropriate drying means to and through which the buttons are by the carrier conveyed, together with wipers, one or more, to the action of which the buttons on the carrier are conveyed, such wipers being seasonably brought for their appropriate enamel-surplus-removing action on the faces of the buttons in the sockets therefor in the carrier.

The invention consists in combinations and arrangements of parts or devices and in the constructions of certain of the parts, all substantially as hereinafter fully described, and covered in the claims.

The machine of the new character indicated as above is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation thereof. Fig. 2 is an elevation as seen at the right-hand end of Fig. 1. Fig. 3 is a central longitudinal section through the enamel containing and applying device, the same being shown as in its working proximity to a button in a socketed chain-block therefor, the valve or shut-off portion of the device here being caused to assume its opening position. Fig. 4 is a side elevation of the same device shown in Fig. 3, the outer shell portion thereof being in section and the relative positions of the parts being such as to exclude the emission of enamel. Fig. 5 is a plan view showing an engraved button in a socketed chain-block.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the frame or supporting structure of the machine, at opposite end portions of which are sprocket-wheels *a a*, around which runs a chain carrier B, each of the chain members thereof having a chain-block *b*, having a screw-shank b^2 at its bottom to engage in its respective chain-link and having in its top a socket or depression b^3 for the reception therein of a button *x*. The upper course of the carrier-chain moves horizontally over supports *c* and *d*, at which the enamel-applying action to and the enamel-surplus removal from the buttons are respectively performed.

C represents the vertically-reciprocatory bar or beam which ranges horizontally and longitudinally of the machine and has mount-

ed thereon to move bodily up and down therewith the enamel-applying device D and the wipers E, the bodily-reciprocatory movements of the device D and wipers E being perpendicular to the plane of traveling motion of the upper course of the chain and the buttons carried thereby.

Any suitable means for producing the progressive movement of the chain-blocks, the reciprocatory movement of the carrier-bar C for the enamel-applying device and the wipers, and the rotary movement of the bodily-reciprocatory wipers may be provided, the means here shown being latterly pointed out.

The device D for containing and applying therefrom the enamel in the form of a ring around on the upper face of the engraved button will be now described particularly. This device comprises a stock or shank f, having an external shoulder f^2, below which is an externally-screw-threaded portion f^3, receiving the screw engagement thereat of the approximately cylindrical shell g, which is open at its lower end and has a portion g^2 of its internal wall somewhat downwardly contracting or convergent to the lower end opening. The stock or shank f has therein the axial comparatively long bore or guiding-socket h, within which closely fits, for free longitudinal play, however, the cylindrical stem i^2 of the internally-located member i, the lower portion of which may be cylindrical or, as preferably shown, slightly downwardly tapered and forming when in the position shown in Fig. 4 a valve or cut-off for preventing the discharge of any of the enamel which is understood as contained in ample supply in the annular chamber j, which is comprised between the internal wall of the casing g and the part centrally located therewithin. The lower end i^3 of the valve member i normally has its location, as shown in said Fig. 4, slightly below the lower end of the downwardly-contracting barrel or casing g, such disposition being maintained by the spiral spring k, located and in compression between the upper end of the bore or socket h and the upper end of the member i, which is somewhat below the socket end, leaving space for occupancy of the spring.

F represents a tank for holding a comparatively large quantity of the enamel, the same being replenished therefrom into the device D through the flexible conduit F^2.

The valve member i has a round hole l of comparatively small diameter drilled axially through it from end to end, the diameter of the upper portion of this hole being somewhat enlarged, as shown, to constitute the internal shoulder l^2, and m represents a shedder-rod, fitted to move vertically in the lower portion of the hole l and to extend downwardly therebelow as limited by its upper end enlargement m^2 engaging against the aforementioned internal shoulder l^2, there being within the upper portion of the hole a spiral spring n in compression between the retaining screw-plug n^2 and the upper end of the shedder-rod. By screwing the plug n^2 inwardly or outwardly the force with which the shedder-rod will be downwardly projected may be rendered such as will best adapt this appliance for the performance of its function.

The support at c over which the chain-blocks are brought and on which they successively momentarily pause is preferably mounted on a plunger or stem c^2, which works up and down in a socketed receiver c^3 and has a spiral spring c^4, so that the chain-block and button thereon may yield under the impact of the enamel-supplying device.

Beyond the button-enameling device in the line of the upper course of the carrier B is an oven G, having a plurality of gas-burners o therein, for which the gas-supply pipe o^2, having a shut-off cock o^3, is provided, and the carrier moving with its intermittent motion through this oven brings the buttons with the circular stripe of the enamel applied around on the engraved portion of each thereof subject to the heating and drying action within the oven, the heat being sufficient relatively to the length of the time of the transit of the buttons through the oven that the enamel, while becoming sufficiently set, is not absolutely hard and dry, so that thereafter when the chain-blocks come in succession under the wipers E, which descend against the buttons and turn thereon, all of the enamel will be wiped off excepting that which is in the letter or character depressions in the buttons, leaving the faces of the buttons clean and bright. In the machine here shown the wipers are indicated as in the form of brushes 1, 2, and 3, the first being a comparatively coarse brush, the second being a medium, and the third a comparatively fine brush, and each is supported at the lower end of a stem p, which plays through a vertical guide p^2 therefor, each guide being affixed on the aforementioned horizontally-ranging and vertically-reciprocating bar C. The spiral spring q, surrounding each brush-stem, causes the maintenance of the brushes in downwardly-distended relations to their carrier and permits of the brushes having yielding contacts against the buttons. Each of the stems has a small pulley or whirl s provided thereto, around which runs a driving-band t, which also encircles and is speeded by the drum u.

As the machine is organized according to the present showing, H represents the driving-shaft, having the fixed and loose pulleys H^2, on which the aforementioned drum for rotating the rotary wipers is fixed.

J represents a counter-shaft having at its end a worm-wheel v, gearing into which is the worm v^2 on the end of the transverse shaft v^3, which has the bevel-gear v^4, meshing into a bevel-gear v^5 on the driving-shaft, the latter shaft through these last-named connections

causing the rotation of the counter-shaft J much more slowly than the driving-shaft. The counter-shaft has thereon the duplicated eccentrics *w w*, the eccentric-straps w^2 of which being pivotally connected at w^3 with the aforementioned beam or bar C, which carries the enamel-supplying device and the wiper or wipers aforementioned.

One of the sprocket-wheels *a* has a ratchet-wheel *y* thereon, with the coacting pawl y^2 on the swinging pawl-carrier y^3, to which the connecting-rod y^4 is pivoted, the opposite end of such rod being also pivoted to the reciprocatory bar C, which forms the common support for both the enamel-applying device and the wipers.

The character of the rotary wipers may be such as will best adapt them for the removal of the surplus of enamel, and in lieu of brushes pads of felt, chamois, sponge, or any material having fitness to the purpose may be employed.

When the chain-blocks come to the right-hand end of the machine, whereat their course descends around the chain-wheel, the buttons will be permitted to fall out into a receptacle therefor, or their removal may be positively effected manually or otherwise.

Changes and modifications may be made as regards specific forms of devices and arrangements without departing from the general character and without affecting the important capabilities of the machine as fairly regarded within the scope and intents and purposes of the present invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a device for supplying enamel onto buttons, a casing having an opening at its bottom and its internal wall downwardly convergent to said opening, a valve member for said opening movable to open and close said opening, a spring for projecting said valve member to its closing position, and a spring-distended shedder projected through and below the lower end of the valve member, and recedable within the latter.

2. In a device for supplying enamel onto buttons, a stock or shank having an axial socket therein, and an annular casing-section having a lower end opening and its internal wall downwardly contracting thereto, the valve member *i* having an axial hole therein and having the stem playing in said socket of the stock, the shedder-rod playing in said hole in the valve member, means for limiting the said rod in its projection beyond the lower end of the valve member, and a spring for downwardly yieldingly forcing the valve member.

3. In a device for supplying enamel onto buttons, a stock having the axial socket *h* and the casing-section *g*, provided with a lower end opening, and its internal wall downwardly convergent, the valve member *i* of round downwardly-tapering form having the cylindrical stem playing in said socket *h* and having the axial hole therethrough, of two diameters with the internal shoulder l^2 the shedder-rod *l* playing in said hole and having the shoulder forming enlargement m^2, the screw-plug in the upper end of the hole and the spring *n* between said plug and the end of the shedder-rod, and the spring *k* within the socket in the stock downwardly reacting against the stem of the valve member, substantially as and for the purposes set forth.

4. In a machine of the character described the combination with a support for a button, of a movably-mounted enamel-applying device, and means for imparting a reciprocatory movement of said device, to, and away from the button in the line of its axis.

5. In a machine of the character described, the combination with a support and carrier for a button, of a movably-mounted enamel-supplying device, means for imparting a reciprocatory movement thereof, to and away from the button, in the line of the axis of the latter and means for imparting an intermittent progressive motion to the carrier.

6. In a machine of the character described, the combination with a chain carrier for buttons, and means for intermittently moving it, of an enameling-applying device movable perpendicularly to the button-carrier, and means for imparting a reciprocatory movement thereof, to and away from the chain carrier perpendicularly thereto, and a yielding support for the chain carrier below the portion thereof adjacent the said enamel-applying device.

7. In a machine of the character described, the combination with a chain carrier for buttons, of a movable enamel-applying device, means for imparting motion thereto periodically toward and away from the carrier in a line perpendicular to the plane of movement of the carrier, and means for intermittently moving the carrier.

8. In a machine of the character described, the combination with a movable carrier for buttons, of a device for applying enamel on the buttons movably mounted and having means for imparting its movements toward and away from the carrier in a line perpendicular to the plane of movement of the carrier, and a drying apparatus to and subject to the action of which the button-carrier moves.

9. In a machine of the character described, the combination with a movable support and carrier for a button, of an enamel-supplying device, and means for imparting a reciprocatory movement of said device, to and away from the button-carrier, a button-wiping device, and means for moving the button-carrier subject to the coöperative action relatively thereto, of the supplying and wiping devices.

10. In a machine of the character described, the combination with a support and carrier

for a button, of an enamel-supplying device, and a wiping device, a reciprocatory support for said devices, means for imparting a reciprocatory movement to said support, to and away from the button-carrier, and means for imparting an intermittent progressive motion to the carrier.

11. In a machine of the character described, the combination with a chain carrier for buttons, of a movable enamel-supplying device, means for imparting motion thereto periodically toward and away from the carrier, an oven through which the chain carrier has its course, and means for intermittently moving the carrier.

12. In a machine of the character described, the combination with a movable carrier for buttons, of a device for applying enamel on the buttons, movably mounted and having means for imparting its movements toward and away from the carrier, a drying apparatus to and subject to the action of which the button-carrier moves, and wiping devices located and operative adjacent the course of the carrier beyond the drying apparatus.

13. A device for supplying enamel onto buttons, consisting of a casing having an opening at its bottom, and having its internal wall downwardly convergent to said opening, and a valve member for said opening, arranged to move relatively to said end opening of the casing to open and close it, and a spring for projecting said valve member to its closed position, in combination, with a reciprocatory carrier for said device, and a button-support thereunder.

14. A device for supplying enamel onto buttons, consisting of a casing having an opening at its bottom, and having its internal wall downwardly convergent to said opening, a valve member for said opening, formed downwardly convergent, arranged to move relatively to said end opening of the casing, to open and close it, and a spring for projecting said valve member to its closed position, in combination with a reciprocatory support for said enamel-supplying device, a chain carrier for buttons, means for reciprocating the support, and means for intermittently progressing the carrier.

15. A device for applying enamel onto buttons, comprising a casing having an opening at its bottom, and having its internal wall downwardly convergent to said opening, and a valve member for said opening, formed downwardly convergent and having its lower end normally below the open end of the casing, a movable support for said casing, a chain carrier having socketed blocks for buttons, means for reciprocating the said casing toward and away from the chain carrier, and means for progressing said chain carrier.

16. The combination with a device for supplying enamel onto buttons, comprising a casing having an opening at its bottom and its internal wall downwardly convergent to said opening, a valve member for said opening movable to open and close said opening, a spring for projecting said valve member to its closing position, and a shedder-rod, spring-projected below the lower end of the valve member, and recedable within the latter, of a reciprocatory support for said enamel-supplying device, a chain carrier for buttons, movable intermittently under the said device, means for reciprocating said support, means for imparting the intermittent movement to the chain carrier and a yielding support below the portion of the chain carrier adjacent the position of the said enamel-supplying device.

17. In a machine of the character described, the combination with a carrier-chain having the members thereof provided with button-receiving sockets, and means for imparting an intermittent motion to the carrier-chain, of a horizontal bar guided for vertical movement and means for imparting reciprocatory movement to said bar, an enamel-discharging device carried by said bar, one or more spindles spring-projected relatively to said bar, means for rotating said spindles, and button-wipers carried at the lower ends of said spindles.

18. In a machine of the character described, the combination with the carrier-chain having the members thereof provided with button-receiving sockets, and means for imparting movement intermittently to the chain, of a horizontal bar vertically guided, and means for imparting reciprocatory movements thereto, an enamel-discharging device carried by said bar, one or more rotary wipers carried by the bar and arranged to yield relatively thereto, means for rotating said wipers, an enamel-containing receptacle and a flexible conduit connected to same and to the chamber in the said enamel-discharging device.

19. In a machine of the character described, the combination with the frame, the shaft J having the eccentric *w w*, the vertically-guided horizontal bar C, and the eccentric-straps connected thereto, means for rotating said shaft, an enamel-discharging device mounted on, and bodily movable with, said bar, and a support for buttons to and away from which the said device is movable, for the purpose set forth.

20. In a machine of the character described, in combination, the frame having an enamel-receptacle mounted thereon, the carrier-chain having button-receiving members, the vertically-movable horizontal bar C having an enamel-discharging device supported thereon, a flexible conduit connecting the receptacle and the chamber in said device, spindles having rotary bearings provided therefor and carried on said bar, having wipers at their lower ends, provided with whirls, and having downwardly-forcing springs, the driving-shaft having the drum *u* and having driving-bands around said drum and said whirls, the

counter-shaft J, and speed-reducing connections between same and the driving-shaft, and reciprocating connections for said bar between the counter-shaft and said bar, and means for automatically intermittently imparting progressive movements to the carrier-chain.

Signed by us at Springfield, Massachusetts, in presence of two subscribing witnesses.

SAMUEL THYBERG.
ALBERT C. L. CHAPMAN.

Witnesses:
A. V. LEAHY,
WM. S. BELLOWS.