June 14, 1949. J. G. WEGMAN 2,473,116

PIN-FORMING AND BUTTON-PINNING MACHINE

Filed Aug. 21, 1945 2 Sheets-Sheet 1

Fig. 1

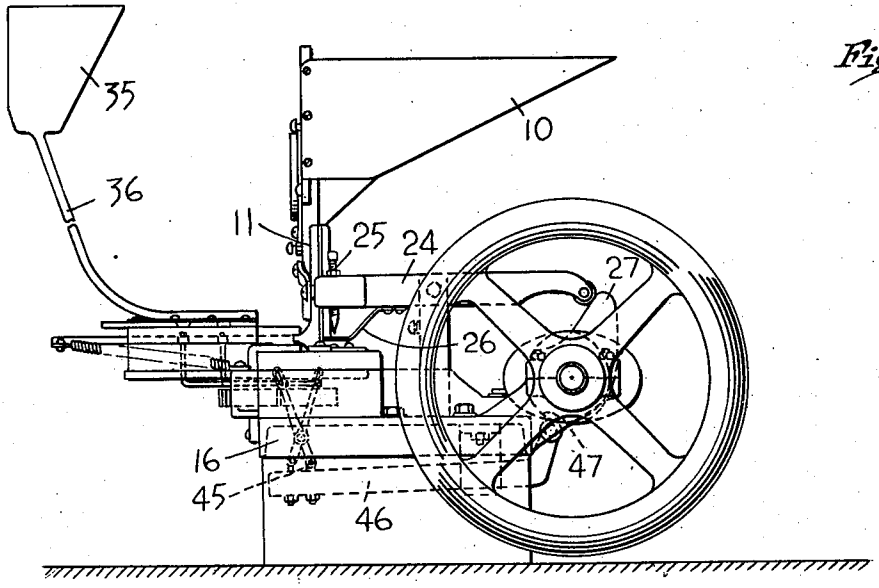
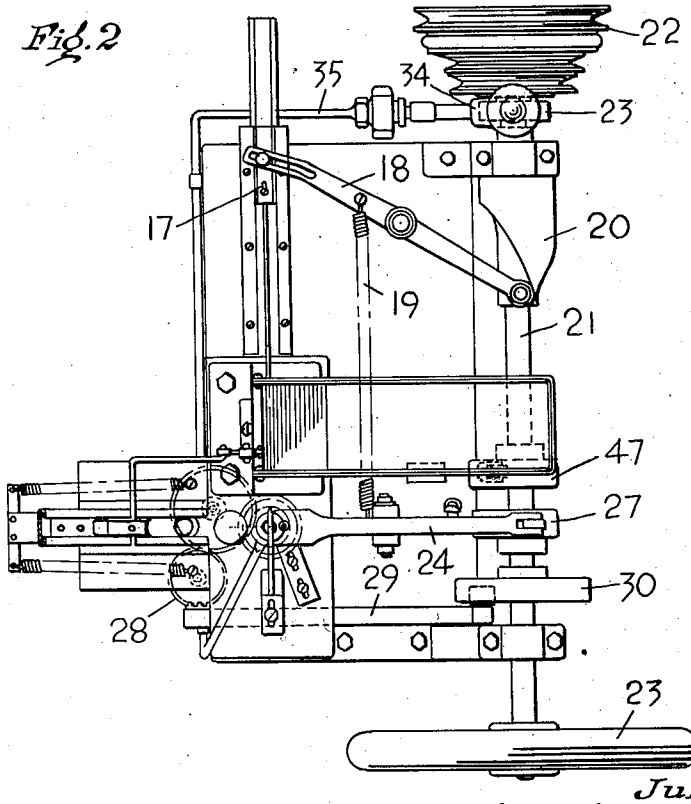


Fig. 2



Inventor

Jules G. Wegman

By E. C. Kitchen

Attorney

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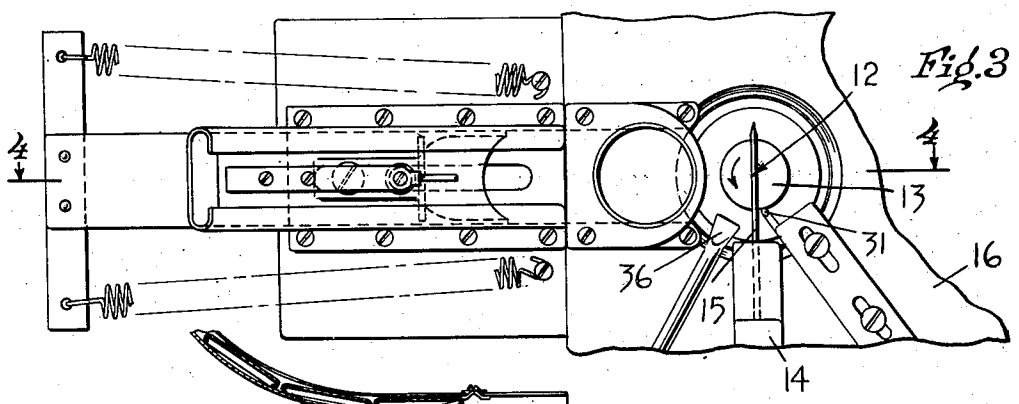


Fig. 3

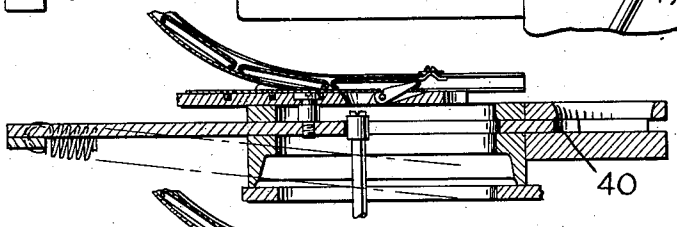


Fig. 5

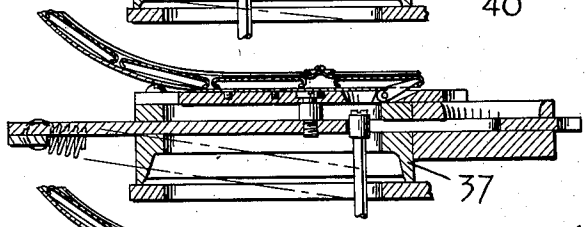


Fig. 6

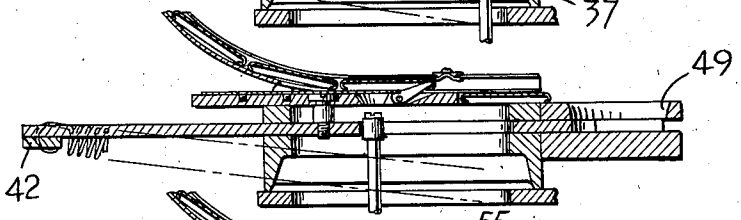


Fig. 7

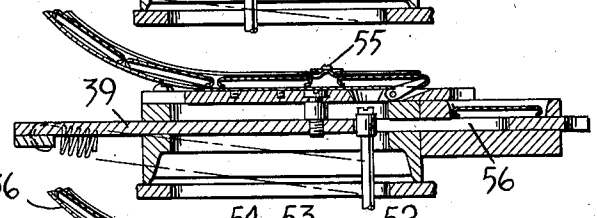


Fig. 8

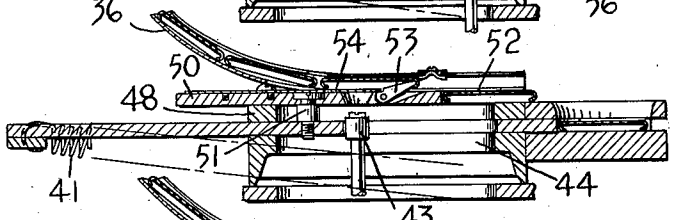


Fig. 9

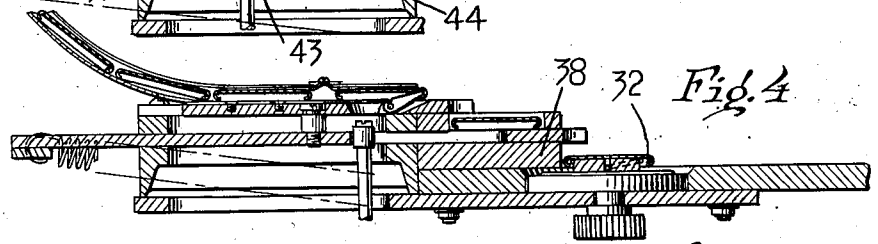


Fig. 4

By Jules G. Wegman

Attorney

Patented June 14, 1949 2,473,116

UNITED STATES PATENT OFFICE

2,473,116

PIN-FORMING AND BUTTON-PINNING MACHINE

Jules G. Wegman, Rochester, N. Y., assignor to Bastian Brothers Company, Rochester, N. Y., a corporation of New York

Application August 21, 1945, Serial No. 611,739
6 Claims. (Cl. 79—3)

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The present invention relates generally to machines for forming pin fasteners for hollow buttons of the type commonly attached by such pins to a coat or other garment for display on the person of the wearer, and more particularly to a machine of the type which both bends and forms the pin fasteners into shape for assembly with the buttons and then assembles the pins and buttons ready for use.

The invention further and more particularly relates to that type of pin forming and pin and button assembling machines described and claimed in my similarly entitled Patent No. 1,463,565, granted July 31, 1923, and has for its primary object the improvement of the patented machine in a manner to insure against breakage and other damage to the working parts in certain instances which will be presently made plain.

In my patented machine, means were incorporated for forcibly and positively feeding the buttons to the pin forming and pin and button assembling station, and in connection with such mechanism incompletely shaped or otherwise malformed buttons could not properly be fed to the shaping and assembling mandrel, so that in such instances the buttons were very likely to become jammed and quickly cause breakage or damage to the working parts. On the other hand it seemed impossible, even with extraordinary care, to avoid the inclusion of incompletely formed buttons among those fed to the machine, and hence, throughout its operation, the patented machine was subject to the danger that buttons might jam and do violence not only to the feeding mechanism itself but to the adjacent parts of the forming and assembling mechanism.

It is for the foregoing reason that the present improvements aim to provide a novel feeding arrangement for the buttons wherein any jamming of buttons or failure thereof to properly feed into the forming and assembling mechanism will merely render the feeding mechanism ineffective for the time being until removal of the offending button from the feed line.

In carrying out the invention, I preferably provide a feeding means including an arrangement wherein the button propelling movements of the feeding parts are spring-actuated and adapted to remain inactive under spring tension, whenever the occasion arises, without interfering in any way with the power-actuated connections for causing the opposite or retractile movements of such parts, or the power actuation of any other parts deriving their movements in whole or in part from the same power source.

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I also preferably include in the feeding mechanism a gauge, by virtue of which incompletely shaped or otherwise malformed buttons will be interrupted and withheld from final feeding movement to the pin forming and assembling station in a manner which will permit of their ready discharge for the normal progress of the next succeeding button completely through the feeding mechanism, such means affording an effective and unfailing check against the final feed to the pin forming and assembling station of any buttons which are not fully in proper condition for the effective assembly of a pin therewith.

With the above general statements in regard to the invention, its details of construction, arrangement and operation may be readily understood from the following description and in connection with the accompanying drawings, which form a part of this specification and in which,

Figure 1 is a side view of the general machine equipped with my improved feeding mechanism.

Figure 2 is a top plan view thereof, the button hopper and feed chute being removed.

Figure 3 is a detailed sectional top plan view of the feeding mechanism and the adjacent pin forming and assembling mechanism, on an enlarged scale.

Figure 4 is a vertical longitudinal sectional view through the same parts, taken substantially on the line 4—4 of Figure 3.

Figure 5 is a detail longitudinal sectional view taken centrally through the feeding mechanism alone, showing the parts in position to engage a button at the discharge end of the feed chute for movement of said button to the first of its successive positions through the feeding operation.

Figure 6 is a similar view with the parts corresponding to the second position of the button.

Figure 7 is another similar view with the parts corresponding to the third position of the button.

Figure 8 is still another similar view with the parts corresponding to the fourth position of the button.

Figure 9 is still another similar view with the parts corresponding to the fifth or final position of the button immediately preceding its final movement to the forming and assembling station.

Referring now more particularly to Figures 1 to 4, inclusive, it will be noted that, as in my patent of the same title above mentioned, the machine includes a hopper 10, from the downwardly opening and vertically disposed feed throat 11, of which previously prepared lengths of resilient wire, pointed at one end, are shifted in the direction of their lengths, one at a time and

with the blunt end foremost through the upper diametrical slot 12 of a vertically disposed and rotating mandrel 13 until the blunt ends of the pins engage a stop member 14. One of the pins is seen in its initial position through the mandrel slot at 15 in Figure 3. All of the above parts are mounted within a frame including a bed plate 16, and from Figure 2 in particular it will be noted that the pins are successively fed to the mandrel by a pin feeding slide 17, actuated in its pin feeding movements through an intermediately pivoted lever 18 by a spring 19, lever 18 being controlled by a cam 20 engaging one end thereof and secured on a cam shaft 21 having pulleys 22 at one end, by means of which it may be driven from any suitable source of power and preferably having a balance wheel 23 at its opposite end. During each such pin feeding operation, the mandrel 13 is, of course, stationary and remains so during the immediately succeeding downward movement of the adjacent end of an intermediately pivoted depressor lever 24 having a depressor pin 25 which engages the pin 15 near the center of the mandrel slot 12 and depresses the sharpened end of the wire into one deepened end portion of the mandrel slot, so that the sharpened end of the wire is thus downwardly offset with respect to the remaining portion.

With the lowering of the depressor pin 25, lever 24 also lowers a spring presser foot 26, so that the pin wire 15 is engaged by this presser foot and held during the offsetting of the sharpened end of the pin. The depressor lever 24 is actuated at its opposite end by a cam 27 on the cam shaft 21.

Immediately following the above, the mandrel 13 starts its rotative movement under actuation of pinions 28, one of which is in engagement with a rack bar 29, the latter in turn actuated by a cam 30 on cam shaft 21. This rotation of the mandrel 13 is in the direction of the arrow shown in Figure 3 and that portion of the pin wire 15 extending beyond the mandrel and including its blunt end is, in this rotation of the mandrel, bent closely around the periphery of the mandrel by reason of its engagement with the upstanding free end of an angular forming finger 31 stationarly disposed at one side of the mandrel. During the rotation of the mandrel and prior to the passage of the blunt end of the pin wire 15 past and free of the forming finger 31, a button 32 is placed over the mandrel as shown in Figure 4. This button is of a well-known circular type having a surrounding and inwardly curved peripheral flange, and it is so proportioned that its flange depends around the mandrel and around not only the pin wire, then closely against the mandrel, but also around the forming finger 31, so that, when, in the final rotation of the mandrel, the blunt end of the pin wire 15 passes beyond finger 31 and becomes thereby released, it will spring of its own tension away from the surface of the mandrel against which it has been tightly pressed and, in its urge to straighten out, will firmly seat within the flange of the button so that the assembly is thereby complete.

Immediately following the complete assembly as above described, and through a cam 33 on the cam shaft 21, a valve 34 is opened in an air blast line, a portion of which is indicated at 35, and terminates in a nozzle 36 disposed immediately adjacent to the forming mandrel 13, the blast from this nozzle lifting the completed assembly

of pin and button and blowing the same free of the mandrel with the parts in the position ready for the immediate disposition of the next succeeding pin wire 15, as previously stated in connection with the mandrel.

It is with the feed of the buttons to the mandrel that the present invention is especially concerned, it being contemplated that the buttons may be fed from any suitable source and by any suitable means, as, for instance, a hopper 35, through a generally U-shaped feed chute 36 in which the buttons are disposed with their flanges downturned.

The buttons may slide in the chute 36 from the hopper 35 in elevated position. On the other hand, any suitable mechanical feed may be provided, insuring the positioning of the buttons in the feed chute with their open faces turned downwardly as above described.

Fixed to and extending laterally from the bed plate 16 is a frame 37 for the feeding mechanism, including a table 38 presenting an upper flat face in continuation of the upper flat face of the frame 37 and projecting to a point immediately adjacent to the upper end of the forming mandrel 13, as will be clearly seen by reference to Figures 3 and 4. Slidable on frame 37, as best seen in Figures 5 to 9, inclusive, is a lower feed plate 39, which has an inner or forward concaved end 40 for shifting a button during each forward feeding movement of the plate, from the upper surface of the table 38 onto the mandrel. This lower feed plate 39 is actuated in its inward feeding movements by springs 41 secured to the frame 37 at one end and connected at their opposite ends to a cross head 42 at the outward or rearwardly projecting end of the feed plate, the latter being actuated during its rearward or outward movements to place springs 41 under tension by connections which may include a stem 43 upstanding through a longitudinal slot 44 of frame 37 and in connection with the feed plate. This stem 43 is actuated through any suitable connections, which may include a rocker arm 45 and rocker bar 46, from a cam 47 on the cam shaft so that these parts when released by said cam will be free for movement with the slide 39 during the inward feeding movements of the latter under tension of springs 41.

Above the inner portion of the lower slide 39 is a longitudinally slotted spacer block 48, the forward or inner end of which overlies the table 38 and has a circular gauge opening 49 through which the buttons 32 must successively drop onto either the upper surface of the lower slide 39 at its inner end or the upper surface of the table 38, such buttons as are unable to drop through the gauge opening 49 being thus prevented from further feed to the mandrel.

On the spacer block 48 is an upper feed slide 50, rigidly connected to the lower slide 39 by a connecting member 51 which slides in the longitudinal slot of the spacer block 48. The upper feed slide 50 has a forward or inner concave button engaging end 52 which is offset outwardly with respect to the concaved end 40 of the lower feed slide 39. The upper slide 50 is also provided with a dog 53 pivoted in connection therewith for vertical swinging movement to project its forward end above the upper surface of slide 50. This dog is controlled by a spring 54.

The upper slide 50 is thus movable with the lower slide 39 and is disposed immediately below the lower discharge end of the button chute 36. Above the feed slide 50, this lower portion of the

button chute has a lengthwise slot in its base and is also provided transversely thereof with a yielding spring button check **55** acting to arrest the lowermost button of the series of buttons moving downwardly toward the feeding mechanism in the button chute **36**.

During each outward movement of the two feed slides **39** and **50**, the latter is so positioned that its dog **53** passes beneath the forward portion of the lowermost button **32** in the button chute and, under control of spring **54**, shifts upwardly into the button so that, on the next successive spring-actuated inward movement of the two slides, the button, so engaged by the dog **53** as shown in Figure 5, is shifted beneath and forwardly of the spring check **55** to the position shown in Figure 6. During the next rearward or outward cam-actuated stroke of the feed plates, the button so engaged is prevented from rearward movement by the check **55** as the upper feed plate **50** engages the next button. At the outer end of its stroke, the forward concaved end **52** of the upper slide **50** passes rearwardly beyond the button shifted forwardly of the check **55** in the preceding operation, so that this button is thus permitted to drop onto the spacer block **48** in the position shown in Figure 7, whereby in the succeeding forward spring-actuated movement of the feed plates, the button will be shifted forwardly above the gauge opening **49** and may drop through the latter onto the upper surface of the lower feed plate **39**, then at the end of its inward stroke. This latter position is indicated in Figure 8.

Upon the next rearward movement of the feed plates, the forward concaved end **40** of the lower feed plate **39** recedes outwardly beyond the button within the gauge opening **49**, to the position shown in Figure 9, so that the button is free to drop onto the feed table **38** in front of feed plate **39**, whereby the latter in its next spring-actuated feeding stroke will shift the button off of the feed table **38** forwardly onto the mandrel **13**, as indicated in Figure 4.

It is, of course, understood that in this continuous operation the buttons follow one another regularly and uniformly except in the event a button fails to drop through the gauge opening **49**, in which event the feed of buttons, of course, stops until the thus rejected button is removed by the operator. Since all button propelling movements of the two feed plates are those inward or forward movements which are spring actuated, it is obvious that any time the feed of buttons is checked there will be nothing to impede continuous operation of the mechanical connections of whatever nature utilized for outward movements of the feed plates for the purpose of placing their actuating springs under tension.

It is obvious from the foregoing that the precise cam-actuated connections for moving the button feed members **39** and **50** are important in the present instance only in so far as they include the stem or other element **43**, having relative movements in the slot **56** of the feed member **39** for the full stroke of said element **43**. Thus it is to be understood that these connections in so far as their cam actuation is concerned may be varied at will, it being obvious that by various means the element **43** may be given a reciprocating movement, causing the shifting of the feed members **39** and **50** in one direction against the tension of the springs as long as the said members are freely movable in the opposite direction under actuation of these springs.

When for any reason, as, for instance, in the case of a jam-up of the buttons, the feed members are checked and prevented from movement by the springs **41**, it will be noted that since element **43** of the power-actuated connections is shiftable in the slot **56** of the feed member **39**, the power-operated connections may continue in their movement independent of the feed members without danger to the feeding parts until such time as the operator eliminates the cause of the jam-up by the removal of a misshapen button.

What is claimed is:

1. In a machine of the type in which pin fasteners are formed and assembled with buttons, and which includes an assembling station, button feeding means including a pair of reciprocating button feeding members, means forming a gauge opening to which the buttons are fed by one of said members, the other of said members receiving the buttons passing through the gauge opening for feeding such buttons to the assembling station, connections between said members constraining the same to uniform movement, spring means engaging one of said members for moving the members in one direction corresponding to feeding movements of the buttons, and power-actuated means for moving the members in the opposite direction and for placing said spring means under tension, including an actuating element, one of said feeding members having a longitudinal slot in which said actuating element is disposed.

2. A button feeding mechanism for pin-forming and button-pinning machines comprising a button feed chute, a reciprocating feed member having means for engaging a button in said chute and for feeding the button in one direction, means on which said feed member is slidable having an extension provided with a gauge opening to which buttons are fed by said feed member, means forming a feed table below said gauge opening to receive buttons dropping through the opening, a second feed member rigidly connected to and movable in unison with the first feed member for engaging and shifting buttons from the feed table, spring means engaging the last-mentioned feed member for shifting both feed members in one direction corresponding to their button engaging and shifting movements, said last-mentioned feed member having a lengthwise slot, and power-actuated connections for moving the feed members in the opposite direction to place said springs under tension including a member extending into the said slot of the second feed member.

3. A button feeding mechanism for pin-forming and button-pinning machines including a pair of reciprocating button feeding members connected for uniform movement, means forming a gauge opening arranged to permit buttons to drop therethrough by gravity, one of said members having means to feed buttons over the gauge opening and the other member having means to shift buttons falling through the gauge opening, spring means for moving said button feeding members in one direction in their button feeding movements, and power-actuated means for moving the feeding members in the opposite direction including an actuating element having a slidable connection with one of the members.

4. A button feeding mechanism for pin-forming and button-pinning machines including a frame having an extension forming thereon a feed table, a reciprocating button feeding member slidable on said frame for movement at one end across said table and provided with a longi-

tudinal slot and an extension projecting beyond the frame, a spring engaging said extension for moving said feed member in one direction in its button feeding movement, power-actuated connections for moving the feed member in the other direction including an element projecting into and slidable within the slot of said member, a spacing member above said feed member having a projection above the feed table provided with a button gauging aperture, a second reciprocating button feeding member slidable on said spacer and having means for engaging and feeding buttons on the spacer to said gauge opening, said second member being connected to the first mentioned button feeding member for uniform movement therewith and a button feed chute above the second feed member, said second feed member having means for feeding buttons from the feed chute onto the spacer.

5. A button feeding mechanism for pin-forming and button-pinning machines including a pair of slidable button engaging and feeding members connected for uniform movement, means forming a button gauging opening through which buttons are transferred from one of said feeding members to the other, a button feeding chute leading to one of said button feeding members, spring means for shifting said button feeding members in one direction in their button feeding movements, and power-actuated connections for moving said button feeding members in the opposite direction, including an element having a slidable connection with one of said members providing for movement of said element corresponding to its full stroke relatively to the button feeding members.

6. In a machine of the type in which pin fasteners are formed and assembled with buttons, and which includes an assembling station, button feeding means including a pair of reciprocating button feeding members connected for uniform movement, means forming a gauge opening to which the buttons are fed by one of said members, the other of said members receiving the buttons passing through the gauge opening for feeding such buttons to the assembling station, spring means effective to move said members in one direction corresponding to their button feeding movements and power actuated connections effective to move said members in the opposite direction and for placing said spring means under tension.

JULES G. WEGMAN.

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The following references are of record in the file of this patent:

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