March 19, 1940. J. MOSCINI 2,194,050

RHINESTONE MAKING MACHINE

Filed Sept. 19, 1938 2 Sheets-Sheet 1

Fig. 1

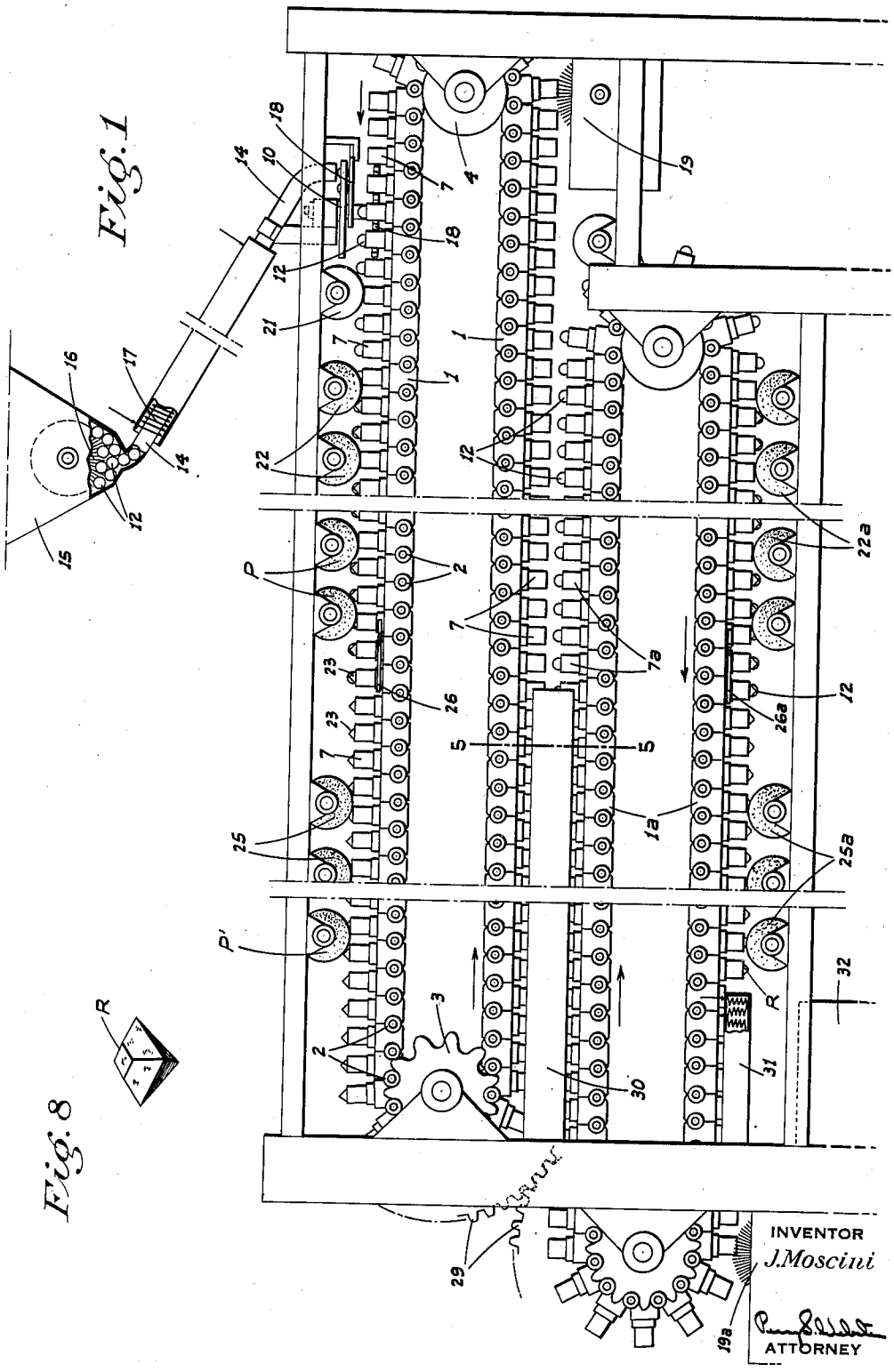


Fig. 8

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Fig. 2

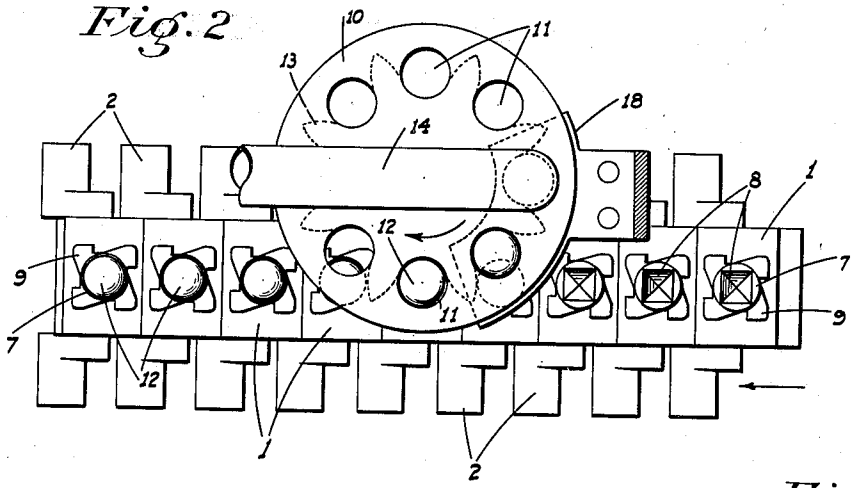


Fig. 3

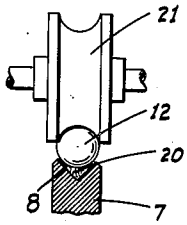


Fig. 4

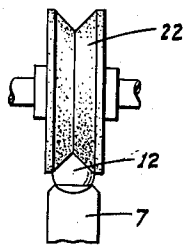


Fig. 5

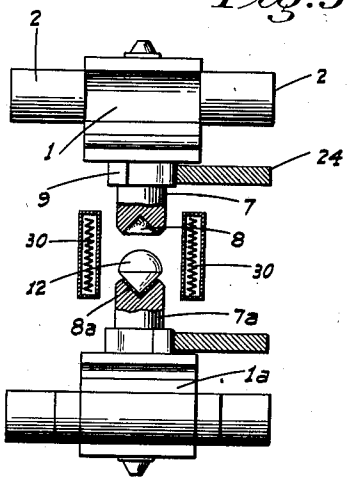


Fig. 6

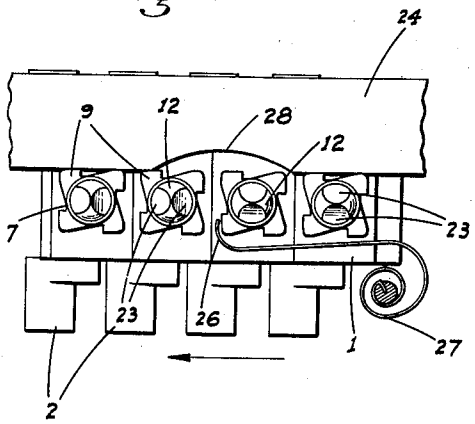
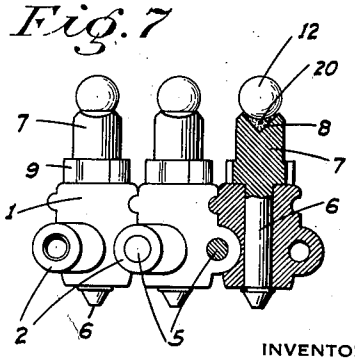


Fig. 7



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UNITED STATES PATENT OFFICE

2,194,050

RHINESTONE MAKING MACHINE

John Moscini, Chico, Calif., assignor to American Rhinestone Company, Inc., a corporation of California

Application September 19, 1938, Serial No. 230,586

6 Claims. (Cl. 51—76)

This invention relates to a machine for making rhinestones, and particularly represents simplifications and improvements over the machine shown in my Patent No. 2,076,502, dated April 6, 1937.

In the previous machine, molten glass was used as the base from which the rhinestones were formed, and one object of the present invention is to eliminate this feature and use instead preformed glass balls, purchasable in the open market, and which may be in a variety of colors.

In connection with such balls, I have provided a simple device for feeding them in proper order to the movable holders on which the balls are ground and polished, and for securing and centering the balls in place prior to the grinding operation.

A further object is to provide a simplified means for transferring the balls from one set of holders to another, in an inverted position when one half of the balls have been ground and polished to give the desired number of finished facets.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a somewhat diagrammatic and foreshortened side view of the machine.

Figure 2 is a fragmentary top plan view showing the device for feeding the balls to the individual holders.

Figure 3 is a fragmentary transverse view showing the ball pressing and centering wheel in operation.

Figure 4 is a similar view showing a grinding wheel in operation.

Figure 5 is a fragmentary cross section on line 5—5 of Fig. 1.

Figure 6 is a fragmentary top plan view showing the means for rotating the holders through a quarter turn after two opposed facets of the balls have been ground, so as to place the other faces in operative relation to the grinding wheels.

Figure 7 is a fragmentary side view of the chain on which the holders are mounted.

Figure 8 is an enlarged view of a finished rhinestone.

Referring now more particularly to the characters of reference on the drawings, the machine includes an endless chain arranged with its runs horizontal and in vertically spaced relation. The chain comprises solid links pivoted together and having outwardly projecting cylindrical lugs 2 on opposite sides adapted to be engaged by the teeth of end sprocket wheels 3 which support and drive the chain at one end. I have shown the lugs of the chain at the other end as being supported by idler rollers 4, but sprocket wheels may of course be used. The links are arranged so that while they may turn on their connecting pins 5 in one direction, they are incapable of deviation from a straight line in the other direction, or in a direction away from their outer faces, as plainly shown in Fig. 6.

Turnably supported in each link is a pin 6, disposed at right angles to the pins 5. Rigid with the pins and projecting from the outer face of the links are cylindrical members 7 forming ball holders, each member at its outer end having a pyramidal socket 8. A ratchet wheel 9, of substantially square form, is rigid with each holder member at the base thereof.

The sprockets 3 are driven at a suitable speed by any desired form of drive mechanism in a direction such that the upper run moves toward the sprockets 3. Mounted above said run adjacent the end thereof opposite said sprockets is a horizontal rotary plate 10, cut through which is a row of round holes 11 slightly larger than the balls 12 from which the rhinestones are fashioned. These holes are centered on a circle which is tangent to the axis of the row of holders on the chain, and are spaced apart the same distance as the spacing of the holders so as to successively register therewith when the plate is rotated at the same speed as the horizontal speed of the holders. Such speed is imparted to the plate by a toothed wheel 13 fixed with the plate, and the teeth of which wheel pass between and are engaged by successive holders, as plainly shown in Fig. 2.

The balls are fed in single file order to the successive holes in the plate through a relatively long conduit 14, which slopes upwardly from registering relation with a hole 11 other than that one which is tangent to the holders, to a connection with the base of a supply hopper 15 in which a revolving yieldable agitator brush 16 is disposed. An electric heater element 17 surrounds the conduit for the greater portion of its length. The balls will thus be heated as they travel along the conduit. To retain the balls as initially delivered into the holes 11 until each hole in succession registers with a holder, a stationary ball

supporting plate 18 is disposed under the rotary plate 10 between the latter and the holders.

The sockets 8 are of sufficient size at their outer end to form seats for the balls, and to secure the balls against movement when dropping into place on the holders from the feed or distributing plate, the sockets ahead of said plate are supplied with a suitable molten cement such as sealing wax by means of a device indicated at 19, and which may be the same as shown in my prior patent. The holder sockets as they reach the distributing plate are thus partially filled or lined with the cement as shown at 29. The cement, even if partially set by the time the balls engage the same, is again immediately rendered in a semi-fluid or molten condition by the heat of the balls.

As the holders move from under the distributor plate, the balls therein are at once engaged by a circularly grooved wheel 21 which presses the balls firmly into place and also centers them. Beyond this wheel is a series of grinding and polishing wheels 22 which grind and polish opposed facets 23 on the balls. The polishing wheels P, of which there are preferably two, are the last in the series. The holders and balls are held against rotation on the chain links during this grinding operation by a fixed guide bar 24 which engages the ratchet members 9 on one side.

These two facets having been finished, it is of course necessary to turn the holders to present the other sides of the balls to the subsequent series of grinding and polishing wheels 25 and P' respectively, arranged as above described. In the present machine, this is accomplished by means of a resilient pawl 26 formed as an extension of a fixed spiral spring 27 disposed to the side of the holders opposite the guide plate and ahead of the pawl itself. This pawl engages between adjacent ratchet members 9, as shown in Fig. 6, and with the continued advancing movement of the latter, causes them to turn one by one through a 90° arc, the guide bar 24 being arcuately cut away for a short distance as shown at 28, to permit of such turning. Even if the turn thus made is not exactly 90°, the members 9 will be properly adjusted to their new position by the reengagement of said members with the guide bar at the end of the turning operation.

The balls are then in position to be operated on by the grinding wheels 25 which complete the production of the rhinestone from the outer or upper half of the balls. The balls must be then inverted, so as to expose the still circular and uncut portions for grinding. To effect this, the holders pass about the sprockets 3 to an inverted or depending position relative to the chain links, where they aline with holders 7a of identical form on the upper run of another endless chain 1a of the same construction as the upper chain. The two chains are connected in driving relation for movement at the same speed and with adjacent runs moving in the same direction by gearing 29 between the end sprockets 3 of the upper chain and the corresponding sprockets 3a of the lower chain.

For a certain portion of the length of the adjacent lower and upper runs of the upper and lower chains respectively, electric heaters 30 extend along the same on opposite sides and as close as practicable to the holders as shown in Fig. 5. The cement in the upper holders is thus softened, and the balls drop of themselves into the sockets 8a of the holders 7a below, cement for which being supplied from a device 19a the same as previously described.

The round, uncut portion of the balls is then exposed for grinding, the ground portion being received in the sockets as shown in Fig. 5. The holders on the adjacent runs of the chains preferably come as close together as possible, so that the extent of drop of the balls is minimized, and after the runs separate, the uncut portion of the balls is acted on by the separate series by grinding and polishing wheels 22a and 25a, with a holder turning pawl 26a between the series as on the upper chain.

When the grinding of the balls is completed and the resultant rhinestones are produced, they are on the holders of the lower chain in an inverted position. The holders may then be subjected to heat from electric elements 31, which softens or melts the holding cement, allowing the finished rhinestones R to drop into a receiving bin 32. The empty holders then move past the cement applying device 19a and again assume a position to receive balls dropping from the upper chain holders. Although balls of various colors may be supplied from the one hopper, I preferably keep them segregated in different hoppers, each being associated with a complete grinding apparatus as above described.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A machine for making rhinestones from preformed glass balls comprising a row of elements each having a socket forming a seat for a ball, a grinding device, means to move the elements as a unit lengthwise of the row and past the device, a ball hopper above the elements, means to apply cement to the sockets at a point ahead of the grinding device, means to distribute balls from the hopper into the sockets in successive order with the movement of the elements and at a point between the grinding device and the point of application of the cement, the cement being of a meltable nature and being applied to the sockets in a molten condition; and means to heat the balls just prior to their distribution into the sockets.

2. A machine as in claim 1, with means to center the balls in the sockets and press the same into the cement before the balls reach the grinding device with the movement of the elements.

3. A machine for making rhinestones from glass elements comprising an endless chain, a plurality of element holders projecting outwardly from and turnably mounted on the chain, means to feed elements onto the holders in successive order at a predetermined point in the length of the chain, separate grinding wheels spaced lengthwise of the chain beyond the point of feed of the elements and each arranged to engage the successive elements on their opposite sides, means functioning with the movement of the chain to turn the holders through a predetermined arc in the space between the wheels, and means normally preventing rotation of the

holders; said holder turning means comprising a ratchet member fixed with each holder and a resilient pawl mounted in a fixed position and engaging said member.

4. In a machine for making rhinestones from preformed glass balls, a row of spaced upstanding ball holders adapted to support balls to be ground on their upper end, means to move the holders lengthwise of the row and past a grinding device, a rotary horizontal plate above the holders, said plate having a row of spaced ball openings arranged about a circle, one opening at a time registering with a holder, means to rotate the plate with the movement of the holders so that the holes in the plate successively register with the holders, a ball supply hopper, means to feed balls from the hopper into the plate holes in successive order with the rotation of the plate and means to prevent the balls dropping clear of the plate until the holes successively register with the holders; said plate rotating means comprising a wheel fixed concentric with the plate and having teeth between the holes therein, the holders being circular and the teeth projecting between adjacent holders in driving engagement; the spacing of the teeth and plate holes being the same as the spacing of the holders.

5. A machine for making rhinestones from preformed glass balls comprising a row of elements each having a socket forming a seat for a ball, a grinding device, means to move the elements as a unit lengthwise of the row and past the device, a ball hopper above the elements, means to apply a meltable cement in a molten condition to the sockets at a point ahead of the grinding device, a relatively long conduit leading downwardly from the hopper and through which the balls move, means to distribute the balls from the conduit into the sockets in successive order with the movement of the elements and at a point between the grinding device and the point of application of the cement and a heating device about the conduit for the major portion of its length.

6. In a grinding machine, an endless chain comprising pivotally connected links, end sprockets about which the chain passes, work holders mounted on and projecting outwardly from individual links and a grinding wheel mounted in a position between the sprockets to engage the work in the holders; the links, outwardly of their pivots, being formed with end faces adapted to engage each other when the links are in straight alinement to prevent inward buckling of the chain and maintain the holders in parallel relationship.

JOHN MOSCINI.