

Dec. 18, 1951

M. HARRIS

2,579,073

APPARATUS FOR SUPPORTING AND COATING GOLF BALLS

Filed Jan. 18, 1947

3 Sheets-Sheet 1

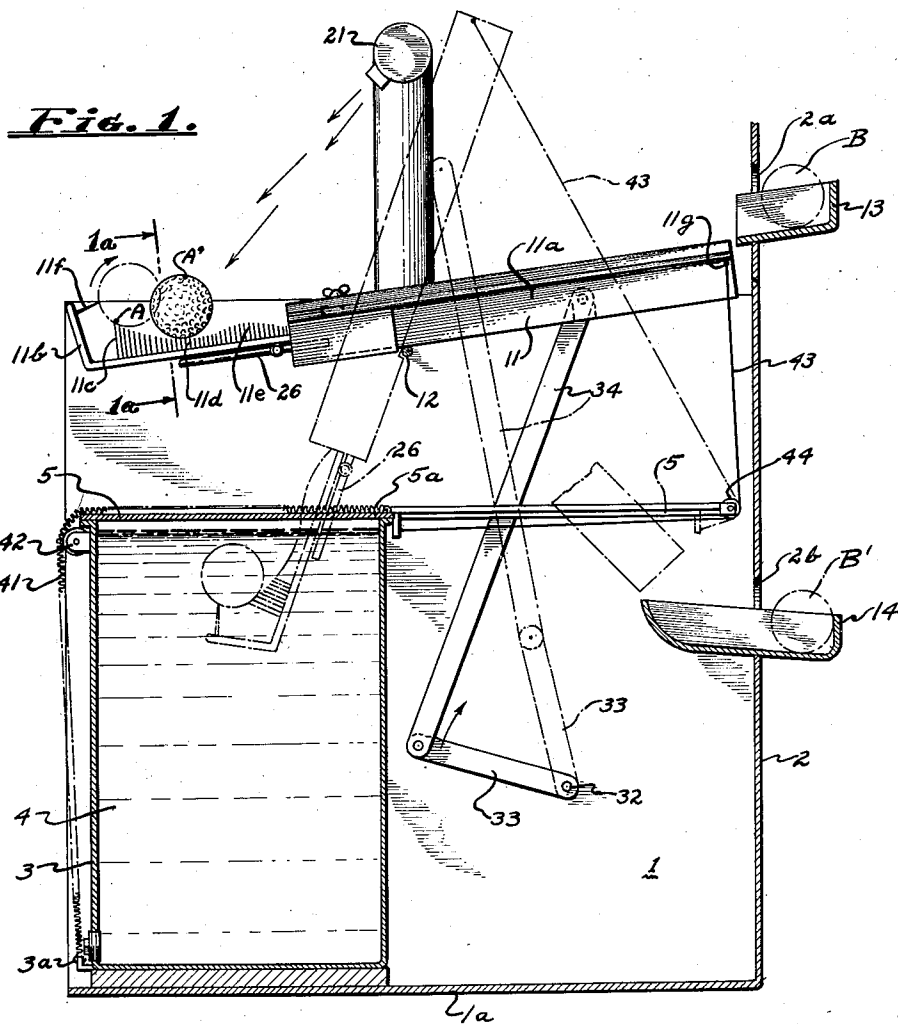
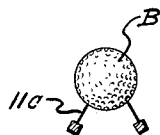


Fig. 1a.



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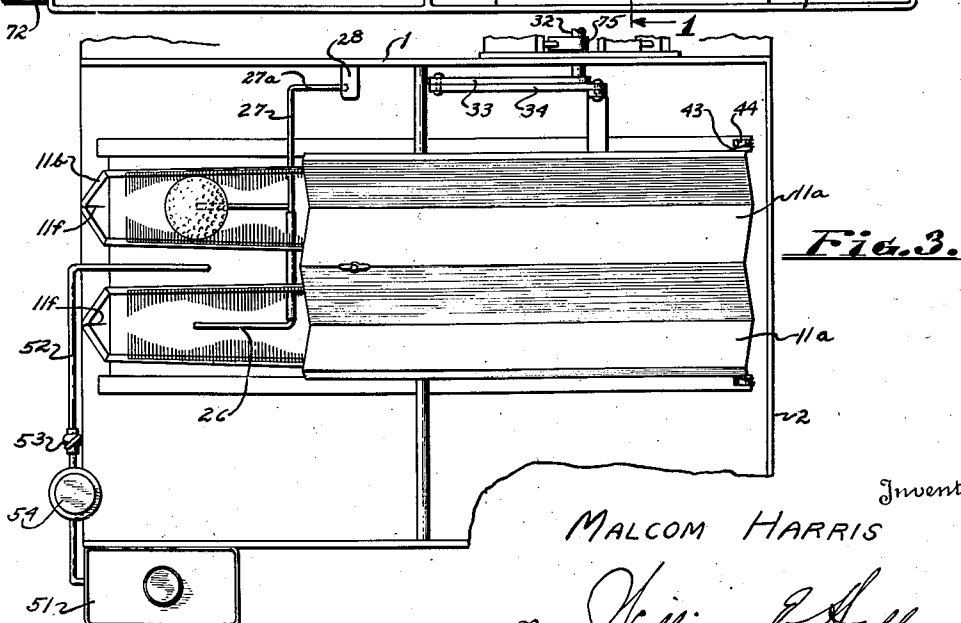
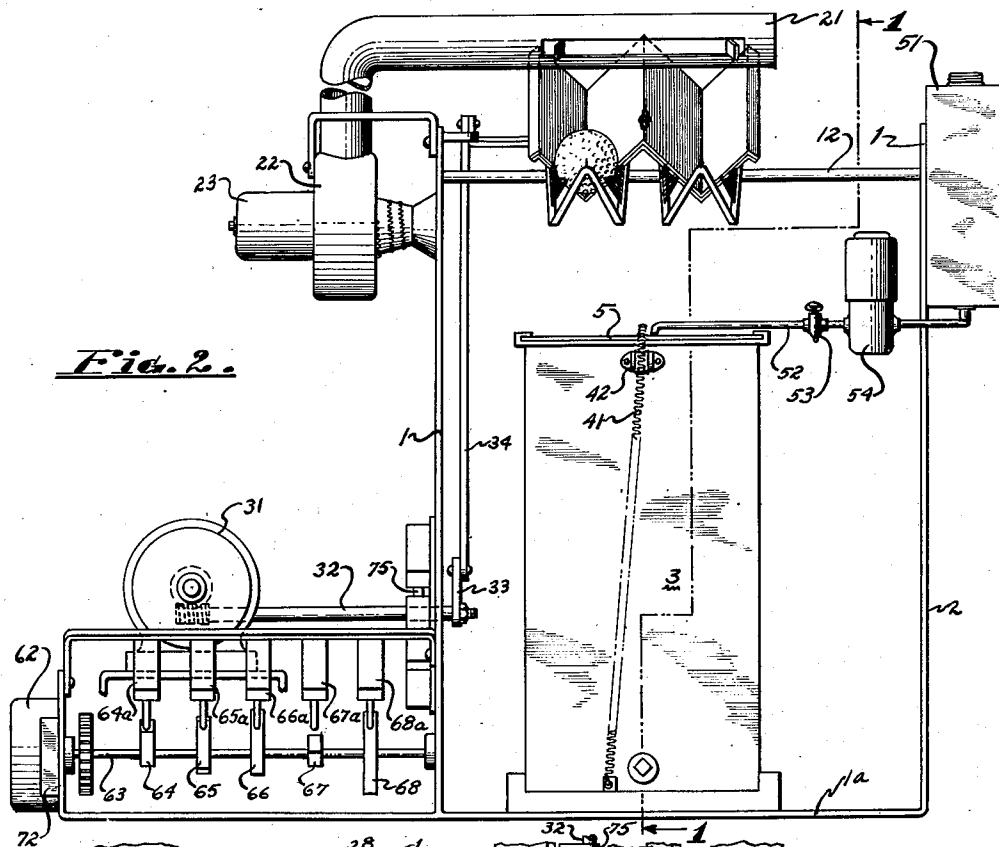
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3 Sheets-Sheet 2



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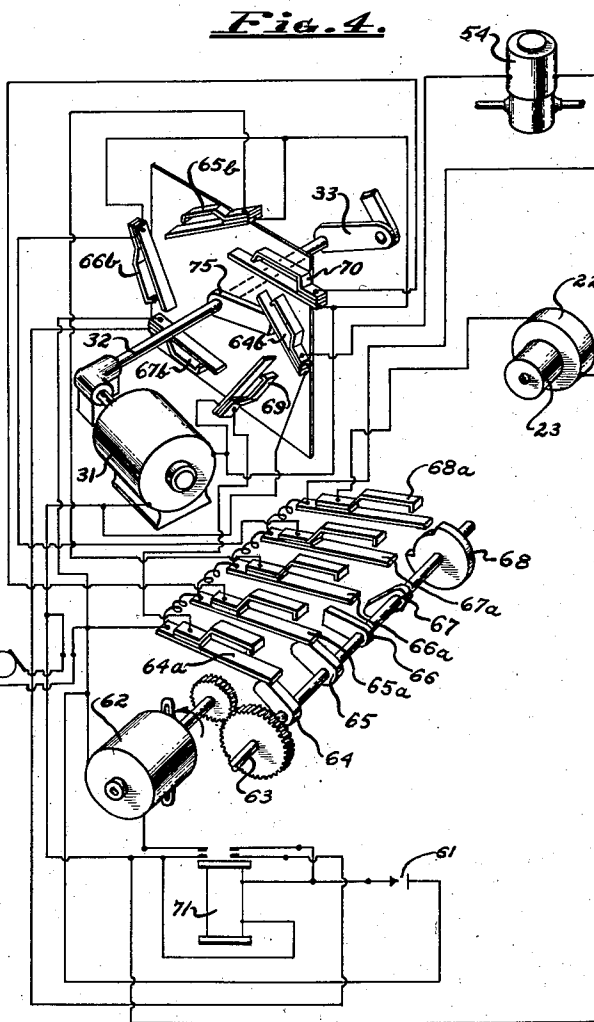
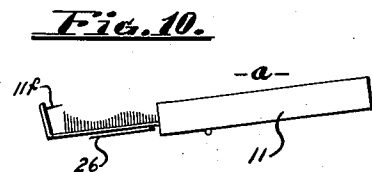
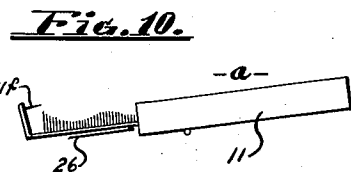
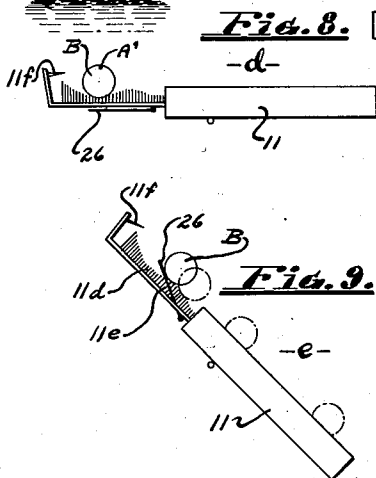
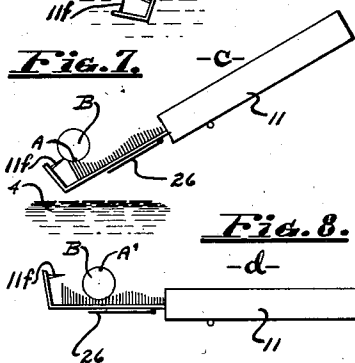
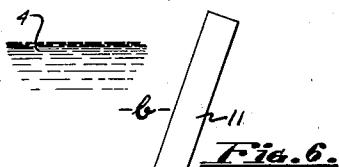
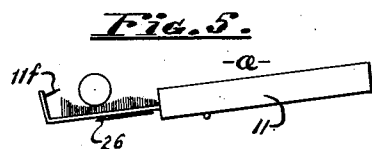
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APPARATUS FOR SUPPORTING AND COATING GOLF BALLS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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APPARATUS FOR SUPPORTING AND
COATING GOLF BALLS

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4 Claims. (Cl. 91—46)

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My invention relates to a ball-coating machine, particularly to an automatic machine for coating golf balls.

After golf balls have been used for some time, and often for a short time, they lose their lustre or white color and take on a gray or dull appearance, and they are then difficult to find.

One of the principal objects of this invention is to provide a machine whereby one or several of such balls may be readily placed in a particular machine or apparatus of my design, and from which the ball or balls are returned in a short period wholly renewed or recoated, having the same appearance as new balls.

Another important object of this invention is to provide a coin-controlled machine or apparatus of this class which may be conveniently installed at golf courses, and into which players or others may place one or more balls, insert a coin of a predetermined denomination, and after a few minutes, or a short period, have such balls returned wholly painted or recoated.

An important object of this invention is to provide a novel holder in the form of a rocker or arm, for receiving and holding the ball to be painted or coated, and whereby the ball is successively immersed in the coating liquid, raised from and above the surface of the coating liquid and allowed to drain from the lower side, then inverted to allow the liquid accumulated at the lower side of the ball in the former position to spread or be distributed over the sides of the ball, in which position the coating liquid is allowed to dry, and whereby the ball is then discharged recoated and ready for use.

An important object also of this invention is to provide a container for the coating liquid, which container is normally closed by a removable cover, and in which the cover is automatically removed to expose the coating liquid when the ball-receiving holder is lowered to immerse the ball in the liquid, and in which the cover automatically closes the container when the ball is raised from the container and after sufficient time has elapsed to permit excess liquid to drain from the ball.

A further important object of this invention is to provide apparatus whereby the lacquer, or other coating liquid, is continually maintained in a state of the desired viscosity properly to coat or cover the ball by injecting a predetermined amount of solvent or thinner into the liquid at predetermined intervals, and particularly during each cycle.

An important feature of this invention is to provide a novelly constructed arm, lever, or

rocker, having a pocket for receiving the ball to be painted or coated, whereby the ball is centered so that it may drain off excess liquid, and whereby the ball is automatically inverted as the rocker is tilted, and further whereby the ball is discharged at the end of the coating cycle.

A further important feature of this invention is to provide an arm, lever, or rocker having pin-point prongs for supporting the ball so as not to mark the surface of the ball as it is being coated and as the liquid dries, a further important feature being the provision of means for easily and positively removing the ball from such prongs to initiate the discharge thereof at the termination of the coating cycle.

A still further important object of this invention is to provide a novel, simple, and efficient timing mechanism for regulating the several steps in the operation of the machine.

An important object also of this invention is the provision of a novel, efficient and economical method of coating golf or other balls.

With these and other objects in view, as will appear hereinafter, I have devised a ball-coating machine having certain novel features of construction, combination, and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Fig. 1 is a sectional elevational view of my machine in a preferred form, and also essentially in schematic form, certain portions being shown by dot-and-dash lines in a shifted position to immerse the ball in the coating liquid;

Fig. 1a is an enlarged fragmentary sectional view, taken through 1a—1a of Fig. 1, showing supporting means for the ball during the coating operation;

Fig. 2 is a front elevational view of my machine, also in schematic form;

Fig. 3 is a fragmentary plan view thereof;

Fig. 4 is a schematic wiring diagram of my machine; and

Figs. 5, 6, 7, 8, 9, and 10 are diagrammatic views of the ball holder or rocker of my machine, the numerically successive views illustrating successive stages of the operation of the machine, or successive steps in the method of coating a ball.

My machine is mounted on a frame 1, which is preferably enclosed by a housing, only the front wall 2 of which is shown. On the base 1a of the frame, and which is also enclosed

by the housing, is a tank or container 3 which contains a lacquer, or other suitable coating liquid, 4. This container has a cover 5 which is slidably removable from the solid to the dotted line position shown in Fig. 1.

On the frame 1 is mounted a rocker 11, which may also be referred to as an arm or lever. This rocker is pivotally mounted intermediate its ends and on a transverse axis on the rod 12, which is shown in Fig. 2 as supported at its opposite ends on the frame.

Each of these rockers, two of which are shown in Figs. 2 and 3, consist of a trough 11^a at the major portion of its rear end, and a forwardly extending arm 11^b on which are provided upwardly extending pins or prongs 11^c. The upper or pointed ends of the prongs or pins form an undulatory curve having primarily a trough or pocket 11^d and a crest 11^e. The trough 11^d provides a runway for the balls towards the prongs 11^c which are also arranged in spaced apart rows extending longitudinally of the runway, so as to permit the balls to roll from the runway of the trough 11^a directly over the pointed ends of the prongs to the end of the extended portion 11^b of the rocker 11.

The rocker 11 is normally in an inclined position, as shown by solid lines in Figs. 1 and 5, so as to permit the ball, to be coated, to roll from the rear end towards the forward or free end of the portion 11^c where it assumes a position of rest in the pocket 11^d. The front wall 2 of the housing of the machine is provided with intake and discharge openings 2^a and 2^b and with appropriate receptacles 13 and 14 in such openings. The receptacle 13 is provided for the reception of the ball B, to be coated, and the receptacle 14 is provided for the reception of the ball B' after it is coated by the machine.

As the ball B is dropped into the receptacle 13, it is permitted to roll into the trough 11^a toward the portion 11^b, as described above, the ball seeking the lowest portion of the depression 11^a while the rocker 11 is in the inclined position. The crest 11^e provides a retarding effect to the rolling of the ball, and is also provided for purposes hereinafter to be described.

The machine is preferably designed to be initiated or to be coin-operated, the mechanism for the reception of the coin and the operation of the machine not being shown. The coin closes a switch for operating the motors and other mechanisms to be described hereinafter.

The rocker or holder 11 assumes five distinct positions, designated *a*, *b*, *c*, *d*, and *e*, and shown in Figs. 5, 6, 7, 8, and 9. The final position, designated *a* and shown in Fig. 10, is the same as that shown in Fig. 5. When the rocker is in position *a*, the ball B is allowed to roll down the runway, as described above, and assume the position of rest shown by solid lines in Figs. 1 and 5. The rocker 11 is then tilted with the free end downwardly through an angle of approximately 60° or more to the position *b*, which permits the ball B to roll slightly from the depression or pocket 11^d toward or over the end prong 11^c where it is stopped by a prong 11^f directed inwardly from the end of the extended portion 11^b. The downwardly tilting of the rocker 11 in this manner causes the ball B, shown by dot-and-dash lines in Figs. 1 and 5, to be immersed in the liquid 4, as shown in Fig. 6. The ball is held in such immersed position for a slight period until the ball is thor-

oughly covered by the lacquer, or other coating. The rocker 11 is then tilted in the opposite direction causing the ball B to be raised from the liquid and only slightly above the surface thereof, permitting the excess liquid to drip from the ball. The ball is held in this position for a predetermined period, causing a certain amount of liquid to accumulate at the under side of the ball, the lower position of the ball being indicated by *A*. The rocker 11 is then again tilted to a substantially horizontal position, designated *d*. The contour of the upper pointed ends of the prongs causes the ball to roll towards the pivotal axis of the rocker to such an extent that the point *A* is shifted from the lower to the upper position, as shown in Fig. 8, allowing the accumulation of liquid to flow downwardly and to be distributed over the sides of the ball. The ball is again held in this position for a predetermined period for permitting such flow and distribution of the liquid. A short period after the ball is moved to the position designated *d*, a blast of hot air is directed over the top of the ball through a duct 21 connected to the discharge end of the blower 22 operated by a motor 23. After the lacquer or other coating liquid on the ball is dry, the rocker 11 is tilted to the opposite position, designated *e* in Fig. 9. The ball is then allowed to roll toward the opposite end of the rocker and is discharged into the receptacle 14 located in the opening 2^b, from which the ball may be removed by the person operating the machine, the finished ball being designated B' in Fig. 1.

To initiate the rolling of the ball B from the depression 11^d down the runway of the trough 11^a, I have provided an arm 26 which substantially raises the ball B from or above the supporting prongs 11^c, to which it may have adhered by reason of the simultaneous drying and lacquer on the prongs.

The rocker is shifted to the various positions above mentioned by a motor 31, which intermittently rotates a shaft 32. On the end of the shaft 32 is provided a crank 33 which is connected to the rocker 11 by a link 34 at the side of the pivotal axis of the shaft 12 opposite the ball-supporting pocket 11^d. The intermittent rotation of the shaft 32 is controlled by a timing mechanism which will be described hereinafter.

The cover 5 of the container 3 is yieldably held in a closed position by a resilient tension member 41, which is here shown as a long coil spring connected at one end to one edge 5^a of the cover and at its opposite end to the lower portion 3^a of the container 3, the tension member or spring 41 extending over the opposite edge of the cover and around a roller 42. The cover 5 is slidably removed from the top of the container 3, as indicated by dotted lines in Fig. 1, by a tension member 43, one end being connected to the edge 5^a of the cover and the other end being connected to the end 11^e of the rocker. The tension member extends around a roller or sheave 44 fixed to the frame 1 on the machine. This connection of the cover 5 to the rocker permits the cover 5 to be withdrawn immediately before the ball is immersed in the liquid in the container, and allows the cover 5 to be again closed over the container after the excess liquid is allowed to drip from the ball B when in the position *c*.

The arm 26, which initiates the rolling or re-

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is raised with respect to the prongs 11^c immediately before the rocker is tilted to its extreme position, designated *e* in Fig. 9. The arm or arms 26 is or are supported on a rock shaft 27 carried by the rocker or rockers 11. One end of the rock shaft has a fixed crank portion 27^a, the free end of which is adapted to engage a lug 28 on the frame 1 for rotating the rock shaft 27 and raising the arms 26 for the purpose above mentioned.

In order to maintain the lacquer or liquid at the proper viscosity, a predetermined amount of thinner or solvent is periodically added to the same, and such addition is made preferably when the cover 5 is removed from the container 3. This thinner or solvent may be supplied from a container 51 carried by the frame 1. The lower end of the container 51 is connected to the upper portion of the container 3 by means of a pipe 52 having a manually controlled cock 53. In the pipe 52 is also interposed an automatic shut-off valve 54. This valve may be magnetically controlled and is timed with the timing mechanism hereinafter described.

The coin-controlled or operating mechanism, which is not here shown, provides for the automatic closing of a switch 61 for closing the electric circuit to a timing motor 62, which is connected in a suitable manner by reduction gearing to a countershaft 63 on which are provided, as shown in Fig. 4, control cams 64, 65, 66, 67, and 68, for closing, at predetermined intervals, microswitches 64^a, 65^a, 66^a, 67^a, and 68^a, which switches are normally open. Microswitches 64^b, 65^b, 66^b, and 67^b, which initiates and control minutely the duration of the several operations, are normally closed. Microswitch 64^a is in series with microswitch 64^b; 65^a is in series with 65^b; 66^a is in series with 66^b; and 67^a is in series with 67^b. These switches, 64^b, 65^b, 66^b, and 67^b, operate the motor 31.

When the cams are in the position, as shown in Fig. 4, the machine is at rest between the cycle of operations, the arm 11 being then in the initial position, as shown in Fig. 5. When the machine is started by closing switch 61, the motor 62 is energized. Cam 65 then closes microswitch 65^a starting motor 31, which the motor operates until arm 75 opens microswitch 65^b. Arm 75, in traversing from switches 64^b to 65^b, closes microswitch 70, opening valve 54. After microswitch 65^b stops the operation of motor 31, arm 11 is in the approximate position as shown in Fig. 6. Cam 66 next closes microswitch 66^a, which causes motor 31 to run until arm 75 closes microswitch 66^b. Arm 11 is now in the approximate position as shown in Fig. 7. Cam 67 next closes microswitch 67^a, which causes motor 31 to run until arm 75 closes microswitch 67^b. Arm 11 is now in the approximate position shown in Fig. 8. At approximately the time of closing microswitch 67^a, cam 68 closes microswitch 68^a, which switch operates the hot air blower. Cam 68 turns off microswitch 68^a at about the time the balls are ejected from the machine. Arm 64 next closes microswitch 64^a which causes motor 31 to operate until arm 75 closes microswitch 64^b. Arm 75 in traversing from 67^b to 64^b opens microswitch 69, which switch is normally closed, releasing relay 71 which stops motor 62. As arm 75 traverses from 67 to 64^b, arm 11 is raised to the approximate position shown in Fig. 9, and then returns to the approximate position shown in Fig. 10. The machine is now at rest and ready for another cycle.

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I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. In a machine of the class described, a frame having a container containing coating liquid, an arm pivotally mounted intermediate its ends at the upper portion of the frame, the arm having one free end normally inclined downwardly from its pivotal axis and disposed above the liquid in the container, said arm being provided with a track thereon along which a ball may roll from the opposite end of the arm to a position above the liquid in the container, a stop at said free end of the arm for limiting the rolling movement of the ball, means defining a pocket on the arm disposed inwardly of said stop toward the pivotal axis of the arm, and timed means operatively connected to said opposite end of said arm for sequentially tilting the arm to immerse the ball disposed against the stop into the liquid, for removing the ball from the liquid by raising the free end of the arm, for further raising the free end of the arm to cause the ball to roll into said pocket so that the excess liquid is directed therefrom, and after a predetermined interval further raising the free end of the arm and lowering said opposite end thereof to cause the ball to roll from the pocket down the track toward said opposite end of the arm.

2. In a machine of the class described, a frame having a container containing coating liquid, an arm pivotally mounted intermediate its ends at the upper portion of said frame, the arm having one free end normally inclined downwardly from its pivotal axis and disposed above the liquid in the container, said arm being provided with a track thereon along which a ball may roll from the opposite end of the arm to a position above the liquid in the container, a stop at said free end of the arm for limiting the rolling movement of the ball, means defining a pocket on the arm disposed inwardly of said stop toward the pivotal axis of the arm, and timed means including a lever system operatively connected to said opposite end of said arm for sequentially tilting the arm further in said one direction to immerse the ball disposed against the stop into the liquid, for removing the ball from the liquid by tilting the arm in the opposite direction, for further tilting the arm to cause the ball to roll into said pocket so that the excess liquid is directed therefrom, and after a predetermined interval further tilting the arm to cause the ball to roll down the track toward said opposite end of the arm.

3. In a machine of the class described, means for supporting a ball to be processed, including a frame, a rocker pivotally mounted on the frame, said rocker having a row of upwardly inclined prongs along each side thereof, the upper ends being pointed and located at varying heights so as to form, with each other, a depression for receiving a ball, said pointed ends collectively providing a support for the ball.

4. In a machine of the class described, means for supporting a ball to be processed, including a frame, a rocker pivotally mounted on the frame, said rocker having a row of upwardly inclined prongs at each side thereof, the upper ends being pointed and converging, said ends being spaced at varying heights and forming, with each other, a depression in which a ball can be located, said pointed ends collectively providing a support for the ball, the contour of the depression longitudi-

nally of the rocker having a curvature greater than that of the ball adapted to be supported therein.

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