May 11, 1937. M. F. HOLT ET AL 2,079,614

COATING MACHINE

Filed Jan. 30, 1933 3 Sheets-Sheet 1

Fig. 1.

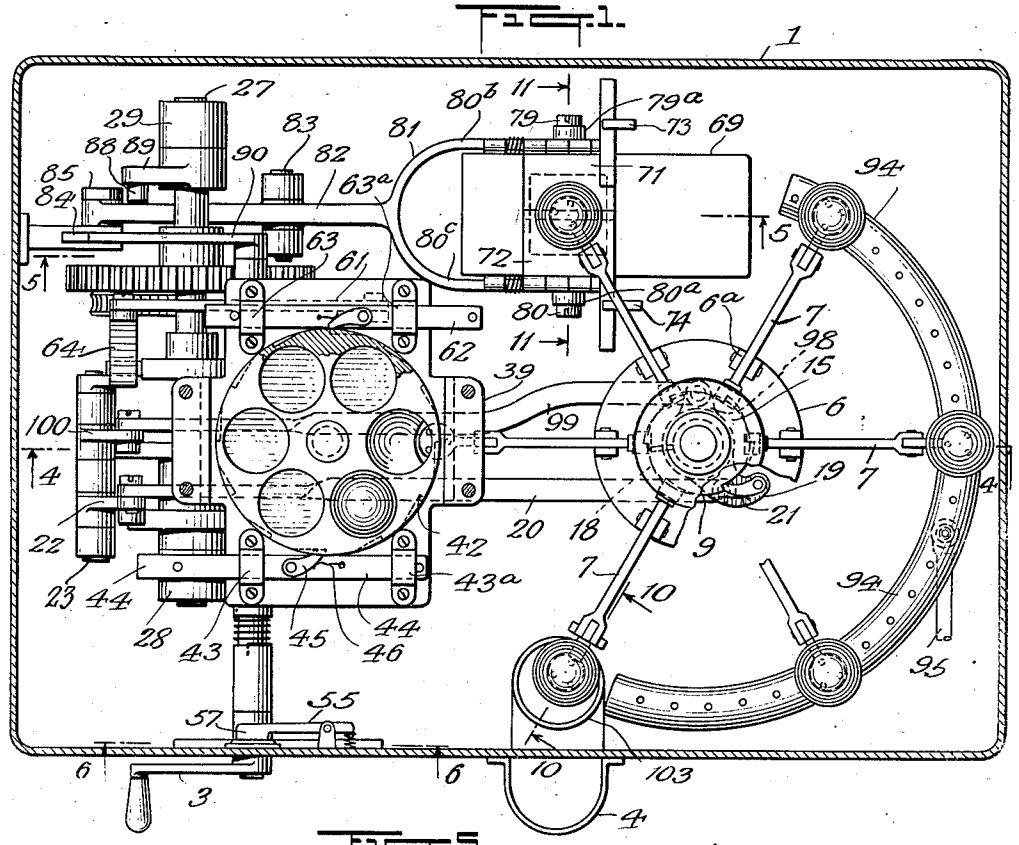


Fig. 5.

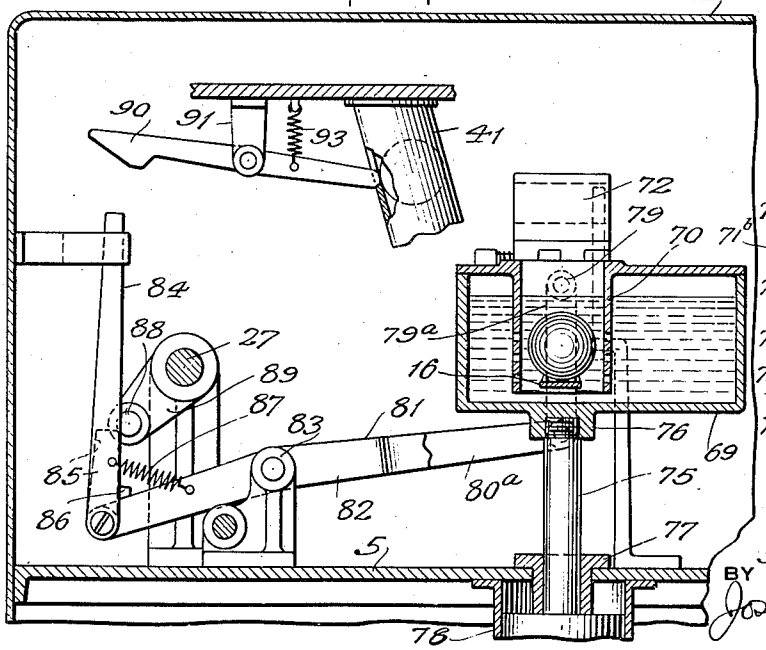
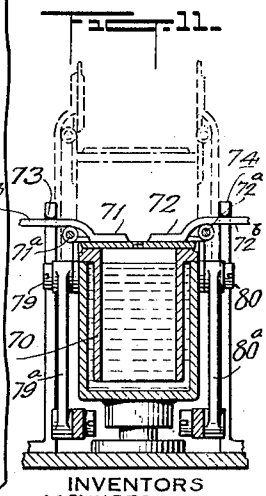


Fig. 11.



INVENTORS
MAYNARD F. HOLT.
SIGMUND N. LIPOWSKI.
BY Joseph V. Meigs
ATTORNEY.

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FIG. 2

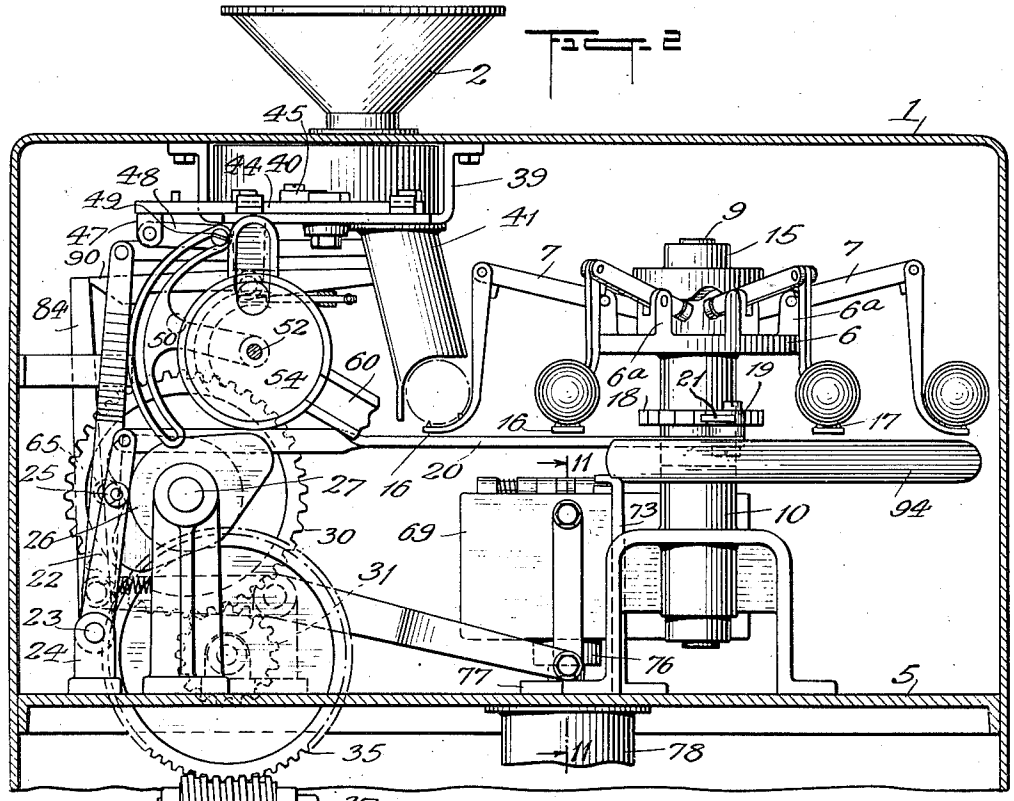
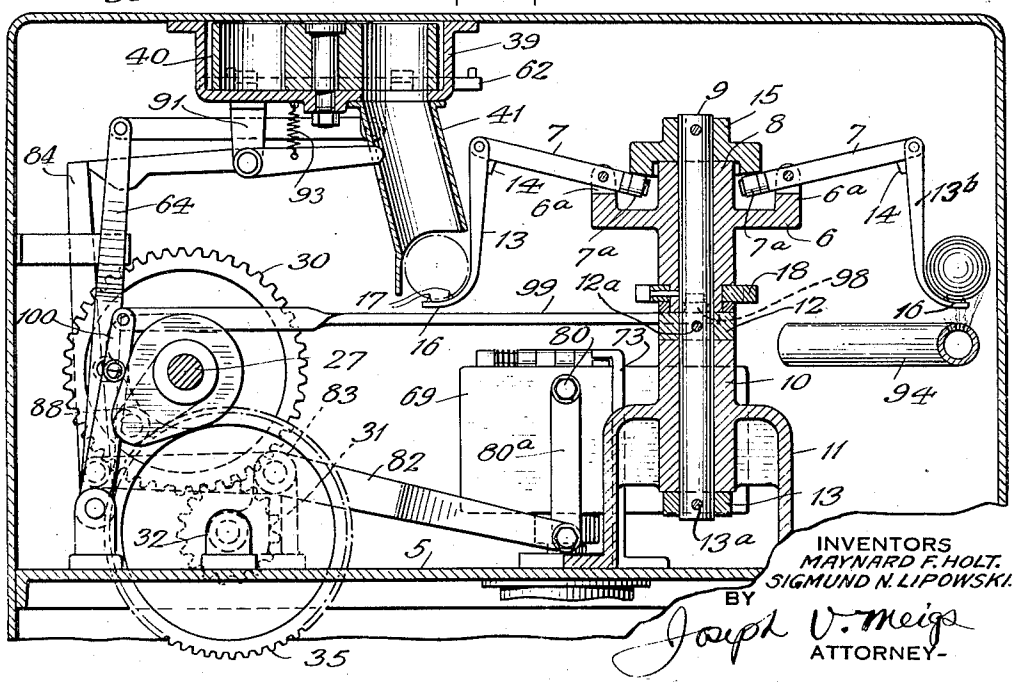


FIG. 4

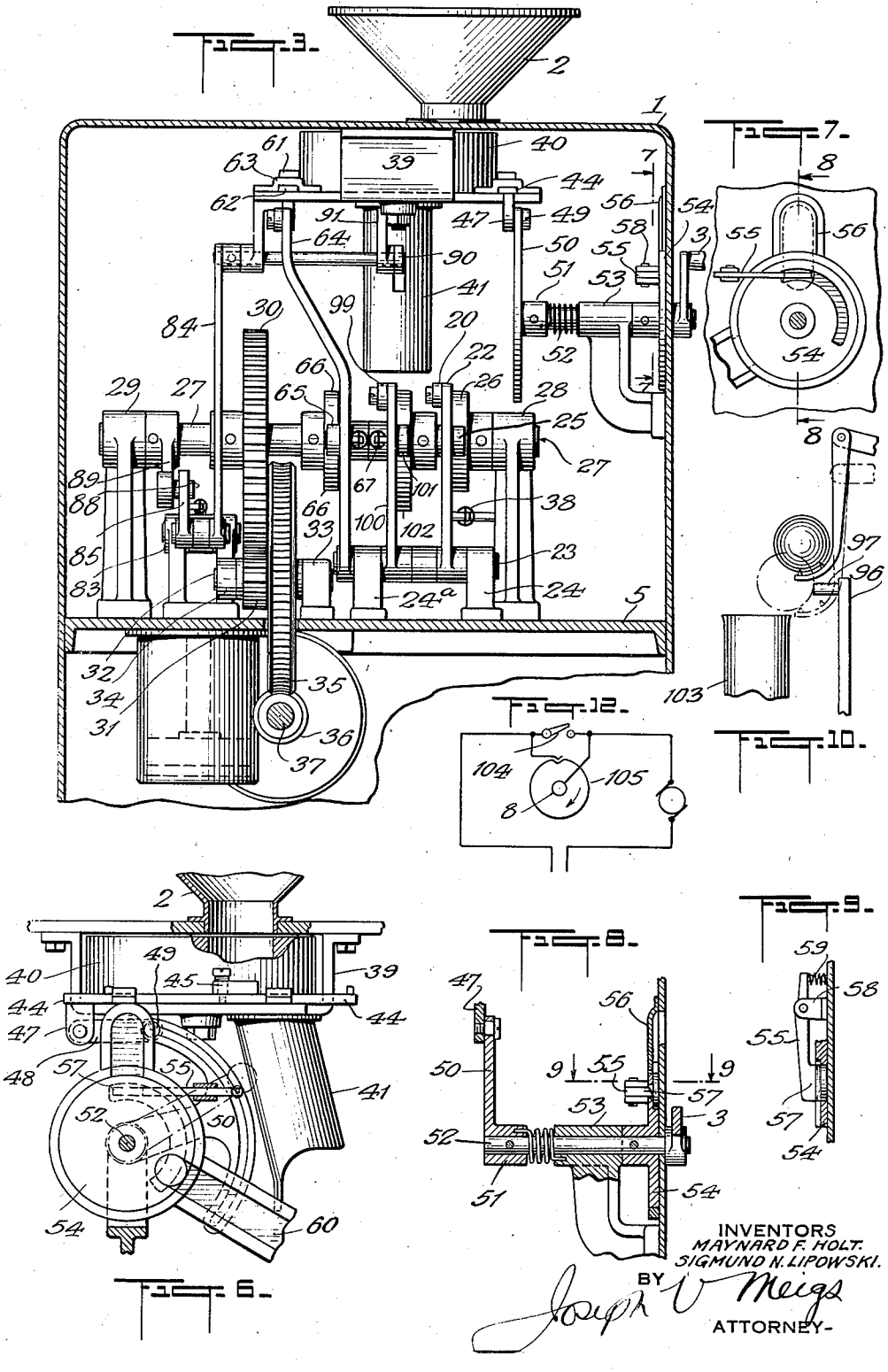


INVENTORS
MAYNARD F. HOLT.
SIGMUND N. LIPOWSKI.
BY
Joseph V. Meigs
ATTORNEY.

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INVENTORS
MAYNARD F. HOLT.
SIGMUND N. LIPOWSKI.
BY Joseph V. Meigs
ATTORNEY.

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UNITED STATES PATENT OFFICE

2,079,614

COATING MACHINE

Maynard F. Holt, Rye, and Sigmund N. Lipowski, New York, N. Y.; said Lipowski assignor to said Holt

Application January 30, 1933, Serial No. 654,188

15 Claims. (Cl. 91—55)

This invention relates to a machine for applying a coating of lacquer to articles, in particular golf balls, and the invention contemplates a machine which delivers articles, which are fed thereto, lacquered, dried and ready for use.

Golf balls are commonly coated with a white lacquer in order to render them readily distinguishable from the elements making up the surroundings in which they are used such as the earth, foliage and grass. When this white coating becomes chipped, broken and dirty, the balls become indistinguishable from the surroundings and in many instances such balls, frequently otherwise in excellent condition, are lost. In order to prevent the loss of balls because of this condition, it is necessary to have them relacquered whenever the white coating becomes dulled and darkened. Heretofore, however, the relacquering of golf balls required the usual large, expensive lacquering plant equipment for that purpose. Because of the equipment and manual labor involved in properly lacquering balls, lacquering places have not commonly been located conveniently to the golf courses, and the cost of relacquering has been comparatively high.

It is a purpose of this invention to provide a machine for lacquering golf balls which is fully automatic, which is of a size convenient to be installed at a golf links and the operation of which may be controlled by a coin. Such a machine should be capable of receiving several balls at once, sorting the balls, and delivering the balls relacquered and dried in the shortest possible elapsed time, and these desirable features are all embodied in the machine of this invention. In accordance with the invention, there is provided a lacquering machine which includes an article dispenser into which several balls may be placed at once and which includes a mechanism which upon operation delivers the balls successively into the machine proper. This delivery mechanism is such that only one ball is permitted to enter the machine at a time and the mechanism is so controlled that delivery of a ball is dependent upon the internal mechanism being positioned to receive the ball. The internal mechanism includes a conveyor on to which the balls are delivered. The conveyor operates through a complete cycle along a definite path for each article lacquered. In the cyclic operation of the conveyor, it is moved by a power device successively into operative relation to a lacquer container into which the ball is dipped, a drier which assists the drying of the coating of lacquer on the ball and a delivery chute from which the ball is delivered for use.

Among the features of the invention are included the fact that the mechanism is compact; the fact that the lacquer container is closed to the atmosphere except during the actual dipping operation; the fact that the complete cycle of operation is performed in a minimum of elapsed time; and the elapsed time per ball decreases when a large number of balls are lacquered successively.

The advantages of our invention include the fact that the machine is small in size and does not require much space; the fact that the operation of the machine may be controlled by a coin; and the fact that the machine is comparatively inexpensive to manufacture.

Specifically, a machine for lacquering golf balls and constituting one embodiment of this invention includes a rotatably mounted conveyor which operates in a horizontal plane. Successively disposed about the path of the conveyor relative to the direction of movement thereof, there is an article dispenser for receiving the golf balls, a lacquer receptacle, a drier and a delivery mechanism. The ball dispenser includes a hopper into which the balls are placed and mechanism for delivering the balls to the conveyor. The delivery of a ball through the dispenser is dependent upon two factors—a manually operative control element and a control element operative from the interior of the machine—both of which must function to deliver a ball into the machine. The manually operative control element partially operates the delivery mechanism of the dispenser. The connection between the manual control and the delivery mechanism for the partial operation thereof is coin controlled. Complete operation of the delivery mechanism of the dispenser to deliver a ball into the machine is controlled in accordance with the operation of the conveyor so that the conveyor will be properly positioned to receive a ball when the ball is delivered through the dispenser.

Following the dispenser, there is a vertically movable lacquer container. This lacquer container is below the horizontal plane of operation of the conveyor. The conveyor and container are relatively movable in a vertical direction to dip articles carried by the conveyor in the lacquer. The lacquer container consists of a dipping chamber and a reservoir. The dipping chamber is closed except during vertical movement of the lacquer container so that the lacquer is exposed to the atmosphere only during

the actual dipping of an article. The movement of the container in a vertical direction is under the control of the dispenser so that the lacquer container will not be moved and the dipping chamber opened unless the conveyor actually carries an article to be dipped.

Next in the order of succession there is an arcuate blower pipe mounted below the plane of operation of the conveyor. The upper surface of this blower pipe is perforated to form a series of air vents through which heated compressed air is blown upon the surface of the coated article carried by the conveyor. The several factors governing the drying of the lacquer, that is, the moisture content of the air delivered through the air pipe, the temperature of the air and the quantity of air per unit of time is such that the coating of lacquer is completely dried while the article passes over this air pipe. At the end of the air pipe there is an abutment which upon relative movement between it and the conveyor, lifts the article from the conveyor and on to the delivery mechanism through which the article is delivered to a pocket accessible from the exterior of the machine.

The specific embodiment of the invention shown in the drawings is described in detail below. From that detailed description, a clearer understanding of the invention and the several features thereof may be obtained.

In the drawings:

Fig. 1 is a plan of a machine embodying my invention;

Fig. 2 is a side sectional elevation of the same;

Fig. 3 is a rear end elevation of the same, the casing being in section;

Fig. 4 is a sectional side elevation taken along the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional elevation taken along the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary sectional side elevation taken on the line 6—6 of Fig. 1;

Fig. 7 is a fragmentary sectional elevation taken on the line 7—7 of Fig. 3;

Fig. 8 is a fragmentary sectional elevation taken on the line 8—8 of Fig. 7;

Fig. 9 is a fragmentary sectional elevation taken on the line 9—9 of Fig. 8;

Fig. 10 is a fragmentary section taken on the line 10—10 of Fig. 1;

Fig. 11 is a sectional elevation of the lacquer container taken on the line 11—11 of Fig. 1; and

Fig. 12 is a wiring diagram of the power circuit.

The machine illustrated in the drawings is for lacquering golf balls; its operation is controlled by coin actuated means, and it is adapted to be installed at a golf links or any other suitable place. A casing 1 encloses the entire operating mechanism of the machine, a hopper 2 for receiving the balls, a manually operative control lever 3 and a ball delivery pocket 4 being the only parts which are exterior of the casing. In the casing, a transverse, horizontal partition 5 supports the operating mechanism of the machine which mechanism, in the machine illustrated, essentially includes a conveyor and a dispenser, a lacquer tank, a drier and delivery mechanism, all successively disposed about the path of the conveyor. The conveyor consists of a circular disk 6 and several unit conveyor elements 7, six in number, mounted on the disk. The circular disk 6 is formed integrally with a bushing 8 which is rotatably mounted upon a vertical shaft 9. The shaft 9 is rotatably mounted in a vertical bearing 10 formed integral with a bracket 11 secured to the partition 5. The shaft 9 is held against longitudinal movement in the bearing 10 by two spaced collars 12 and 13 which abut against opposite ends of the bearing 10. Each of the collars 12 and 13 is secured to the shaft by a transverse pin 12*a* and 13*a*. The lower end of the conveyor bushing 8 rests upon and is supported by the edge of the collar 12. On the disk, at the edge thereof and uniformly spaced about the disk, there is formed integral with the disk six bifurcated brackets 6*a* extending perpendicular to the disk. In these brackets, the six unit conveyor elements are mounted. Each conveyor element consists of two levers pivotally secured together, one lever 7 extending radially of the disk 6 and pivotally mounted between its ends in a bifurcated bracket 6*a* and another lever 13 having one end pivotally secured to the radially outer end of the lever 7. The lever 7 carries a stop member 14 against which the lever 13 abuts to prevent this freely suspended lever from swinging radially inwardly from a vertical position. On the radially inner end of the lever 7 there is mounted a cam follower 7*a* which engages the cam edge of a cam bushing 15 mounted on the upper end of the shaft 9 extending through the conveyor bushing 8. This cam engaging the cam followers on the end of the levers 7 controls the vertical position of the levers during the rotation of the conveyor and normally maintains the levers 7 substantially horizontal. The arm 13 of a conveyor element is curved to extend at a right angle near its lower or free end. This end portion is widened to form a platform 16. The platform 16 of a conveyor element has a series of three spaced prongs 17 extending therefrom and upon which a golf ball is supported by point contact.

The conveyor disk 6 is rotated in a step by step movement to move the conveyor elements through a circular path in a horizontal plane. The rotation of the conveyor is accomplished through a ratchet 18 secured to the conveyor bushing 8 adjacent that end of the bushing which abuts against the collar 12. Cooperating with this ratchet there is a pawl 19 pivotally mounted on a rod 20. A leaf spring 21 presses the pawl 19 against the ratchet. The rod 20 is reciprocated to actuate the ratchet through mechanism at the rear of the machine and the rod extends through the machine to the rear thereof. The end of the rod 20 is pivotally connected to one end of a lever 22, the opposite end of which is rotatably mounted upon a shaft 23 supported by bearing brackets 24 and 24*a* mounted upon the partition wall 5. Intermediate the ends of the lever 22, there is mounted a cam follower 25 which abuts against a cam 26 secured to a cam shaft 27 that extends transversely of the machine and which is rotatably mounted in bearing brackets 28 and 29. On this shaft there is mounted to rotate therewith a spur gear 30 which meshes with a pinion 31 secured on a shaft 32 parallel to the shaft 27 and mounted in short bearing brackets 33 and 34. Secured on to the shaft 32 beside the pinion 31 there is a worm gear 35. The worm gear extends through a slot in the partition 5 and meshes with a worm 36 secured on a shaft 37 mounted below the partition 5. The shaft 37 is the shaft of an electric motor which is used for supplying power and movement to the parts of the machine. Thus, the train of motion for moving the conveyor is from the motor through the shaft 37 to the worm

36 and worm gear 35 to the pinion 31. From the pinion 31 motion is transmitted to the spur gear 30 and the cam shaft 27. As the cam shaft rotates, the cam 26 is rotated therewith and acts upon the cam follower 25 on the lever 22. The lever 22 is moved towards the rear of the machine for each revolution of the cam shaft by the action of the cam 26 and through the pawl and ratchet moves the conveyor through one-sixth of a revolution. The lever 22 is maintained against the cam by a spring 38 connected to the lever and the bearing bracket 28. The conveyor is thus rotated one-sixth of a revolution for each revolution of the cam shaft 27.

The balls to be lacquered are delivered to the conveyor through the hopper 2 mounted on the top of the machine. This hopper forms a part of a ball dispenser which includes delivery mechanism for delivering the balls to the conveyor elements. The hopper communicates with a dish-shaped bracket 39 which is secured to and forms a closed chamber with the upper wall of the casing. In this bracket 39 which is as deep as the diameter of a golf ball, there is rotatably mounted a disk 40 having a series, six in number, of ball receiving pockets. From the bottom of the bracket 39 there extends a ball chute 41 through which a ball may pass from the interior of the bracket on to one of the conveyor elements, the chute 41 extending adjacent the path of the conveyor and positioned so that the mouth of the chute is directly over a conveyor element when a conveyor element is properly positioned with respect thereto. The opening through the upper wall of the casing connecting the hopper to the bracket 39 is angularly displaced through an angle of 60° from the opening connecting the chute 41 to the interior of the bracket 39 so that there is never a direct communication between the hopper and the chute 41. The pocket-containing disk 40 mounted in the bracket 39 is rotated counter-clockwise, as seen in Fig. 1, to bring the pockets successively into communication first with the hopper and then with the chute 41. The disk has a series of ratchet teeth formed therein and angularly disposed about the disk through angles of 60°. Pawls cooperating with these ratchet teeth rotate the disk.

At one side of the disk, slidably mounted in brackets 43 and 43*a*, there is a bar 44. The bar 44 carries a pawl 45 which is pressed against the side of the pocket disk 40 by a leaf spring 46. On the end of the bar 44, there is mounted a depending bracket 47 to one end of which there is pivotally secured a lever 48. The other end of the lever 48 carries a pin 49 that extends into a groove in a crank arm 50. The crank arm 50 is secured through a bushing 51 formed thereon to a shaft 52. The shaft 52 is mounted in and supported by an L-shaped bearing bracket 53 one end of which is secured to the front wall of the casing. The shaft 52 extends through the front of the casing and has mounted on the end thereof the control lever 3. Immediately behind the front wall of the casing, there is mounted on the shaft 52 a disk 54 which cooperates with a lever 55 for controlling the operation of the shaft 52. The disk 54 extends between a plate 56 mounted on the back of the front wall of the casing. The plate 56 is spaced from the casing a distance equal to the width of a coin, such as a five cent piece. The disk 54 has a slot therein into which, in the normal or inoperative position of the lever 3, a wedge-shaped lug 57 formed on the end of the lever 55 extends. The lever 55 is pivotally mounted between its ends in a bifurcated bracket 58 and is urged about its pivotal connection by a spring 59 to a position in which the lug 57 extends into the slot in the disk 54. The edge of the lug when it extends into the slot abuts against the edge of the slot and prevents the disk and shaft from rotating. When a coin is inserted in the coin-receiving opening in the front wall of the machine, it passes down the slot in the disk between the plate 56 and the wall of the casing and it acts against the inclined surface of the wedge-shaped lug and forces the lug out of the slot in the disk. The disk and consequently the shaft may then be rotated by the manually operative lever 3. As the disk is rotated the coin in the slot in the disk is carried around through an angle of approximately 135° and is deposited in a coin-receiving chute 60. As the shaft is rotated, the slot in the crank 50 permits the crank to move through an angle of approximately 105° without moving the bar 44. During the last 30° of movement, however, the end of the slot engages the pin 49 and moves the bar 44. The bar 44 will rotate the pocket disk through the pawl 45, and the movement of the bar is just sufficient to move the pocket disk through an angle of 30°. Thus, by the manually operative lever 3, the pocket which was formerly registering with the hopper 2 will be moved to a position between the opening in the casing communicating with the hopper 2 and the opening in the bracket 39 communicating with the chute 41.

The pocket disk is moved the remaining 30° to bring the pocket (thus moved to a position between the hopper and chute 41) into register with the chute 41 by a pawl 61 mounted on a bar 62. The bar 62 to one side of the pocket disk 40 is diametrically opposite to the bar 44. Like the bar 44, the bar 62 is slidably mounted in a pair of brackets 63 and 63*a*. The bar 62 is movable only through a distance sufficient to move the pocket disk through an angle of 30° so that it requires movement of the pocket disk through the limit of movement of the two bars 44 and 62 in order to move a pocket from a position in communication with the hopper 2 to a position in communication with the chute 41. The rod 62 is actuated by the internal mechanism in relation to the conveyor elements and it is connected at one end to a lever 64, the other end of which is rotatably mounted on the shaft 32. Intermediate the ends of the lever 64, there is mounted on the lever a cam follower 65 which engages a cam 66 mounted on the cam shaft 27. The cam 66 is so designed and mounted on the shaft that the lever 62 will be moved the full extent of its movement towards the rear of the machine after the conveyor disk 6 has completed a one-sixth movement. When the conveyor is stationary at the end of each one-sixth movement a conveyor element is directly beneath the chute 41. The cam follower 65 is held against the cam 66 by a spring 67 acting upon the lever 64. Thus, it will be seen that rotation of the pocket disk through an angle of 60° is dependent upon two power elements, one a manually operative element, the lever 3, and the other a mechanically operative element, the lever 64. The first of these elements is coin controlled so that the pocket disk can not be moved to deliver a ball without the insertion of a coin. The latter control element which is mechanically controlled assures that when a pocket containing a ball registers with the delivery chute 41 a conveyor element will be positioned beneath the chute to receive the ball passing therethrough.

Following the dispensing mechanism, relative to the direction of movement of the conveyor elements, and spaced angularly therefrom through an angle of 60°, there is a lacquer container 69 mounted below the horizontal plane of rotation of the conveyor elements. The lacquer container is divided by a rectangular partition wall 70 into a dipping chamber and a reservoir. The dipping chamber and reservoir are in communication below the wall 70 and through perforations in the wall 70. The lacquer container is completely closed except for the opening to the dipping chamber and this chamber is closed by a pair of doors 71 and 72 which are pivotally secured to the upper edge of the container by pivots 71*a* and 72*a* extending through hinges formed on the doors and brackets on the container. Each of the doors has a lever 71*b* and 72*b* extending therefrom transversely to, and beyond the edge of the container. Cooperating with the door levers are brackets 73 and 74 which extend over the levers in the closed position of the doors.

The lacquer container is movably mounted on a piston rod 75 one end of which is threaded into a lug 76 formed on the bottom of the container. The piston rod extends downwardly through a bushing 77 in the partition wall 5 and into a cylinder 78. In the cylinder, the piston rod is secured to a perforated piston and the cylinder and perforated piston act in the capacity of a dash pot to cushion downward movement of the lacquer container. With this piston rod mounting, the lacquer tank can be moved in a vertical direction and for this purpose trunnions 79 and 80 extend from each side of the container. From these trunnions respective levers, 79*a* and 80*a*, extend downwardly, and their lower ends are pivotally connected to the arms 80*b* and 80*c* of a cradle 81. The cradle 81 is formed on the end of a lever 82 which is pivotally mounted between its ends in a bracket 83 secured to and mounted on the partition wall 5. The free end of this lever 82 is pivotally secured to two vertical levers 84 and 85, one on each side of the lever 82. The levers 84 and 85 are secured to a common pivot extending through and journaled in the lever 81. The levers 84 and 85 are urged against a vertical stop 86, formed on the lever 82, by a spring 87 connected at one end to the lever 85 and at the other end to the lever 82. The lever 85 cooperates with a crank pin 88 mounted on a crank 89. The crank 89 is secured to the cam shaft 27 to rotate therewith. As the crank rotates, the crank pin abuts against the top of the lever 85, depressing the lever 85 and the rear end of the lever 82. By virtue of this movement of the lever 82 the lacquer container is raised in a vertical direction through the cradle 81. The position of the crank 89 is such, relative to the conveyor movement cam, that the lacquer container is raised only after the conveyor has completed a one-sixth revolution at which time a conveyor element is positioned directly over the dipping chamber of the lacquer container. It will be observed that as the lacquer container is moved upwardly, the levers 71*b* and 72*b* on the doors 71 and 72 engage the brackets 73 and 74 and the doors are swung about the pivots to an open position as illustrated in Fig. 11. When the lacquer container descends to its original position the force of gravity acting on the doors cause them to close. Thus the smallest area of lacquer is exposed to the atmosphere for the shortest possible time, only during the actual dipping operation.

Since there are six conveyor elements and the conveyor makes one complete revolution for each ball, it is possible that a conveyor element not containing a ball may be positioned over the lacquer container. Six conveyor elements are provided merely to speed the operation in the event that a number of balls are to be successively lacquered. In order to prevent the lacquer tank from being open to the atmosphere when there is no ball in the conveyor element above the lacquer container, a control lever 90 is provided which cooperates with the lever 84 and normally maintains the lever 85 out of the path of the crank pin 88 to prevent operation of the lacquer container. The lever 90 is pivotally mounted between its end in a depending bracket 91 secured immediately behind the chute 41. One end of the lever 90 extends through a slot into the chute 41 and the other end of the lever extends into engagement with the lever 84. A spring 93 normally maintains the lever 90 in position to press the lever 84 rearwardly and thus hold the lever 85 out of the path of the crank 88. When however a ball passes through the chute 41, it actuates the lever 90 against the spring 93 and releases the lever 84. When the lever 84 is released, the spring 87 draws the lever 85 into the path of the crank pin 88. As the lacquer container does not operate until the conveyor makes a one-sixth revolution after a ball passes through the chute 41, the container will not be elevated unless the conveyor element over the container carries a ball to be dipped. The lacquer container is return from its raised position to its normal position by the action of the force of gravity acting thereon. The dash pot at the end of the piston rod serves to soften the downward movement of the lacquer container and thus avoid any splashing of the lacquer.

Following the lacquer container, and below the plane of operation of the conveyor elements, there is an arcuate pipe 94 supported by the partition wall 5. This arcuate pipe is closed at both ends and has a series of perforations along its upper surface. The pipe is connected through a pipe line 95 to a source of warm compressed air (not shown). This warm compressed air may be supplied from a tank within the machine, a compressor being connected to the operating motor of the machine to supply the compressed air to the tank. However, the source of supply is connected to the arcuate pipe 94 and a blast of warm air is directed vertically. The radius of curvature of the arcuate pipe is the same as the distance from the center of the conveyor to the carrying platform of the conveyor elements so that as the conveyor rotates the conveyor elements successively pass directly over the arcuate pipe. Thus the air blast from the perforations in the pipe is directed onto the balls carried by the conveyor elements. The temperature, volume and water content of the air passing over a ball while a conveyor element passes over the pipe are sufficient to dry the lacquer.

At the end of the arcuate pipe and slightly spaced therefrom, there is mounted a vertical rod 96 (see Fig. 10) which has a finger 97 extending directly under the path of movement of the platforms of the conveyor elements. As a conveyor element reaches this, the last of its six angular positions in a complete revolution, it is moved downwardly in a vertical direction.

This downward movement of the conveyor element is effected through a groove as shown in

the cam 15 which is rotated through the shaft 9 to bring the groove into alignment with the cam follower on the end of the lever 7. The shaft 9 is oscillated through a crank 98 formed on the collar 12, a rod 99 pivotally secured at one end to the crank 98, a lever 100 pivotally mounted on the shaft 23 and connected at its free end to the end of the rod 99, a cam follower 101 mounted between the ends of the lever 100, and a cam 102 mounted on the cam shaft 27. As the conveyor element moves downwardly the finger 97 engages the side of a ball on the conveyor element and displaces the ball so that the ball drops off of the conveyor element. Below this element there is the mouth of a chute 103 into which the ball is dropped. This chute communicates with the bracket 4 forming the pocket on the exterior of the machine into which the lacquered balls, dried and ready for use, are delivered.

In Fig. 12 of the drawings, the power circuit to the motor of the machine is illustrated. This circuit includes two switches, one 104 operated by the manual lever 3, and the other a hold-in switch consisting of a broken conductor ring 105 mounted on the conveyor bushing 8 and a brush to engage in sliding contact with the ring. The two switches are connected in parallel. The switch 104 serves to start the motor which upon operation moves the conveyor bushing so that the brush passes from the break in the ring into contact with the ring. The ring switch then holds the circuit for one complete revolution of the conveyor until the brush again reaches the break in the ring.

The operation of the machine described above is as follows: In this description of the operation of the machine we shall assume that the operator of the machine has but a single ball which he desires to be lacquered. The ball is inserted in the hopper 2 and passes into a pocket in the pocket disk 40. A coin is then inserted in the coin slot in the front of the machine. The coin moves down between the front wall of the casing and the plate 56 into the slot in the disk 54. As the coin is pressed downwardly it forces the wedge lug 57 out of the slot in the disk 54. The operator may then rotate the lever 3. As the lever 3 is rotated, into the paper as shown in Fig. 3, the shaft 52 is rotated through an angle of 135°, the switch 104 is closed and the coin is released to the coin receiving chute. During the last 30° of rotation of the shaft the edge of the groove in the crank 50 engages the pin 49, moves the bar 44 and rotates the pocket disk 40 through an angle of 30°. The pocket which was in register with the hopper and into which the ball descended is thus moved to a position between registry with the hopper and with the chute 41. Operation of the rod 62, as heretofore described, rotates the pocket disk through the remaining 30° to bring the pocket containing the ball into register with the chute 41. The ball descends through the chute 41 on to the conveyor element and operates the lever 90 during its passage through the chute so that the lever 84 is released and the lever 85 moves into the path of the crank pin 88.

The cam 26 operating on the cam follower 25 of the lever 22 rotates the conveyor through a one-sixth revolution so that the conveyor element which received the ball is moved to a position over the dipping chamber of the lacquer container. As the conveyor reaches this position the crank pin 88 engages the end of the lever 85 and the lacquer container is raised. At the same time the lever rotates the shaft 9 so that the groove in the cam 15 becomes aligned with the end of the lever 7 of the conveyor element carrying the ball. The conveyor element thus moves downwardly as the tank moves upwardly and the ball is dipped into the dipping chamber. As the crank rides off of the lever 85, the container descends to its original position; the dash pot arrangement, previously described, prevents a jarring of the lacquer container.

Following the dipping operation, the cam 26 again engages the follower 25 of the lever 22 and rotates the conveyor through another one-sixth of a revolution at which point the ball is over the forward end of the pipe 94 relative to the direction of movement of the conveyor element. Each succeeding revolution of the shaft 27 rotates the conveyor one-sixth of a revolution until the ball carrying conveyor element reaches the position adjacent the delivery bracket 96 at which point, when the cam 15 is rotated, a groove in the cam is aligned with the end of the lever 7 and the conveyor element moves downwardly in a vertical direction. The pin or finger 97 abuts against the ball as the conveyor element moves downwardly and pushes the ball off the conveyor into the ball receiving chute through which it is delivered to the pocket 4.

If more than one ball is to be lacquered the several balls are placed in the hopper at one time and the operator inserts in succession as many coins as there are balls, rotating the lever 3 once for each coin inserted. In this way the several conveyor elements each receives a ball and whereas it requires approximately a minute for the conveyor to make a complete revolution, thus lacquering, drying, and delivering a single ball, the elapsed time will be approximately one and five-sixths minutes for six balls by virtue of the fact that it will only be necessary for the conveyor to make approximately one and five-sixths revolutions for the entire six balls.

It will be seen that the machine which we have devised is of a convenient size and can be readily installed at a golf links or other suitable place. Its coin control mechanism avoids the necessity of manual supervision and thus permits an economical lacquering of used balls.

It will be obvious that various changes may be made by those skilled in the art in the details of the embodiment shown in the drawings and above particularly described within the principle and scope of my invention as expressed in the appended claims. Thus, for example, instead of dipping the ball in a body of lacquer, we may provide means for spreading or spraying the ball with a varnish, paint or lacquer.

We claim:

1. A machine for coating articles with a lacquer comprising a conveyor for carrying the articles to be coated and means for moving the conveyor in combination with an article dispenser for receiving articles to be lacquered and delivering the articles on to the conveyor, a lacquer containing receptacle, drying means for assisting the drying of lacquer, and delivery means for delivering articles from the machine, all operatively related to and disposed successively about the path of the conveyor, means for causing vertical movements in opposite directions of the conveyor and the lacquer receptacle respectively to dip an article carried by the conveyor in the lacquer, and control means for said lacquer receptacle moving means.

2. In a machine for coating articles with a

lacquer the combination comprising a conveyor for carrying the article to be lacquered, means for moving the conveyor, and a dispensing device including a hopper for receiving the articles, means for delivering the articles in the hopper to the conveyor, and control means for said delivery means including a manually operative control element and a control element actuated in accordance with the position of the conveyor.

3. In a machine for coating articles with a lacquer the combination comprising a conveyor for carrying the article to be lacquered, means for moving the conveyor, a lacquer container below the conveyor, and means for causing vertical movements in opposite directions of the lacquer containing receptacle and the conveyor respectively to dip an article on the conveyor in the lacquer.

4. Automatic mechanism for coating used golf balls comprising in combination: a conveyor adapted to receive and convey through a predetermined path a plurality of balls delivered to said conveyor at uniformly separated time intervals said conveyor comprising a vertical shaft carrying a plurality of radially extended arms each of which is adapted to receive and convey a single ball; ball dispensing means to deliver a ball to said conveyor comprising a rotatable horizontal disc having therein a plurality of circular ball receiving and ball delivering apertures equal in number to the plurality of ball conveying arms on the conveyor, said disc cooperating with a subjacent plate having an aperture therein which registers with each disc aperture in turn as the said disc rotates and simultaneously registers with each arm of the said conveyor; ball coating means; cam means to actuate the conveyor, the ball delivering means and the ball coating means respectively; and means cooperating with the ball delivering means and ball coating mechanism whereby the latter becomes operative to coat the ball only upon delivery of a ball by the ball dispensing means to the conveyor.

5. Automatic mechanism for coating golf balls comprising in combination; a conveyor adapted to advance a ball by intermittent motion to and from successive stations including a ball receiving and dispensing station and a ball coating station said conveyor comprising a plurality of radial arms adapted to rotate in a horizontal plane; ball dispensing means at the ball dispensing station comprising a horizontally rotatable disc carrying a plurality of peripheral apertures cooperating with a subjacent plate to form ball pockets, said plate having an aperture adapted to permit a ball to fall therethrough; ball coating means at the ball coating station; cam means on a common cam shaft to operate the conveyor, the ball dispensing means and the ball coating means which cam means during operation advances a ball to and from its successive stations and simultaneously brings into registry a conveyor arm, a pocket in the rotatable disc and the said aperture in the subjacent plate thereby permitting the delivery of a ball from the dispenser to the conveyor; and means connected with the dispenser and ball coating mechanism respectively whereby the latter becomes operative to coat a ball only upon delivery of a ball from the dispenser to the conveyor.

6. In a machine for coating the entire surface of articles with a lacquer, the combination comprising a conveyor for supporting and carrying an article including an arm rotatable about a vertical axis and point supports carried thereby for engaging the article, means for delivering an article on to the point supports carried by the arm, a lacquer container angularly disposed about the center of rotation of the conveyor arm with respect to said delivery means, means for rotating the conveyor arm from a position to receive an article from the delivery means to a vertical plane passing through the lacquer container and the axis of rotation of the conveyor arm, and means for effecting relative vertical movement of the conveyor arm and lacquer container to immerse the article carried thereby in the lacquer and remove the article from the lacquer.

7. In a machine for coating the entire surface of articles with a lacquer, the combination comprising a conveyor for supporting and carrying an article including an arm rotatable about a vertical axis and point supports carried thereby for engaging the article, means for delivering an article on to the point supports carried by the conveyor arm, a lacquer container angularly spaced about the center of rotation of the conveyor arm with respect to said delivery means, means for rotating the conveyor arm from a position to receive an article from the delivery means to a vertical plane passing through the lacquer container and the axis of rotation of the conveyor arm, means for effecting relative vertical movement of the conveyor arm and lacquer container to immerse the article carried thereby in the lacquer and remove the article from the lacquer, and means angularly spaced from the lacquer container for removing the article from the conveyor arm.

8. In a machine for coating the entire surface of articles with a lacquer, the combination comprising a conveyor for supporting and carrying an article including an arm rotatable about a vertical axis and point supports carried thereby for engaging the article, means for rotating the arm, delivery means for delivering an article on to the point supports of the conveyor arm, a lacquer container, drying means and an abutment all successively spaced angularly about the center of rotation of the conveyor arm, means for effecting relative vertical movement of the conveyor arm and lacquer container to immerse the article in the lacquer, and means to effect relative vertical movement of the abutment and conveyor arm to remove the article from the conveyor arm.

9. In a machine for coating an article with a lacquer, the combination comprising means for coating an article with a lacquer and means for delivering articles to the lacquering means including a rotatably mounted disk having an opening therethrough adapted to receive an article to be lacquered, a plate on each side of said disk, one of said plates having an article receiving opening therethrough and the other having an article delivering opening therethrough angularly spaced about the disk with respect to the receiving opening in the other plate, and operating means for the disk comprising a pair of elements, means for actuating one of the elements to rotate the disk from a point in which the opening therethrough registers with an opening through one of the plates to a position in which the opening therethrough is midway between the openings through the plates, and means for actuating the other element to move the disk to a position in which the opening therethrough registers with the opening through the other plate.

10. In a machine for coating an article with a

lacquer, the combination comprising means for coating an article with a lacquer and means for delivering articles to the lacquering means including a rotatably mounted disk having an opening therethrough adapted to receive an article to be lacquered, a plate on each side of said disk, one of said plates having an article receiving opening therethrough and the other having an article delivering opening therethrough angularly spaced about the disk with respect to the receiving opening in the other plate, and operating means for the disk comprising a pair of elements, means for actuating one of the elements to rotate the disk from a point in which the opening therethrough registers with an opening through one of the plates to a position in which the opening therethrough is midway between the openings through the plates, means for actuating the other element to move the disk to a position in which the opening therethrough registers with the opening through the other plate, and means for coordinating the action of said last mentioned element with the operation of the lacquering means.

11. In a machine for coating an article with a lacquer, the combination comprising means for coating an article with a lacquer and means for delivering articles to the lacquering means including a rotatably mounted disk having an opening therethrough adapted to receive an article to be lacquered, a plate on each side of said disk, one of said plates having an article receiving opening therethrough and the other having an article delivering opening therethrough angularly spaced about the disk with respect to the receiving opening in the other disk, and operating means for the disk comprising a pair of elements, manually operative means for actuating one of the elements to rotate the disk from a point in which the opening therethrough registers with an opening through one of the plates to a position in which the opening therethrough is midway between the openings through the plates, means for actuating the other element to move the disk to a position in which the opening therethrough registers with the opening through the other plate, and means for coordinating the action of said last mentioned element with the operation of the lacquering means.

12. In a machine for coating articles with a lacquer, the combination comprising means for coating an article with a lacquer including a conveyor for the articles to be lacquered, means for delivering articles to said lacquering means including a delivery chute for dropping articles dispensed by the delivery means on to the conveyor of the lacquering means and control means for said delivery means including a pair of control elements each operative to effect partial operation of the delivery means, manually operative means for actuating one of said control elements, and means for actuating the other of said control elements in accordance with the operation of the conveyor.

13. In a machine for coating golf balls by a dipping operation, article coating mechanism including a lacquer container, a conveyor, and ball delivering mechanism, said conveyor being located subjacent and in spaced relation to the ball delivering mechanism, said ball delivering mechanism including means for delivering the ball to the conveyor by a downward movement of the ball, said conveyor including means for receiving the ball from the ball delivering mechanism at a predetermined position in respect to the conveyor and for maintaining the ball in that position during the coating operation, and means for effecting substantially reciprocating movement of the conveyor and the ball in a vertical plane contained in the lacquer container to dip the ball on the conveyor into the lacquer in the container.

14. In a machine for coating golf balls by a dipping operation, article coating mechanism including a lacquer container, a conveyor, and ball delivering mechanism, said conveyor including point support means for receiving the ball from the ball delivering mechanism at a predetermined position in respect to the conveyor and for maintaining the ball in that position during the coating operation, and means for effecting substantially reciprocating movement of the conveyor and the ball in a vertical plane contained in the lacquer container to dip the ball on the conveyor into the lacquer in the container.

15. In a machine for coating articles by a dipping operation, article coating mechanism including a lacquer container, article delivering mechanism and a conveyor, said conveyor being located in spaced relation to the article delivering mechanism, said article delivering mechanism including means for delivering the article to the conveyor by a downward movement of the article, said conveyor including means for receiving the article from the article delivering mechanism at a predetermined position in respect to the conveyor and for maintaining the article in that position during the coating operation, and means for effecting reciprocating movement of the conveyor and the article in a vertical plane contained in the lacquer container to dip the article on the conveyor into the lacquer in the container.

MAYNARD F. HOLT.
SIGMUND N. LIPOWSKI.