March 25, 1952 J. I. PNEUMAN ET AL 2,590,456

MACHINE FOR PRINTING ON SPHERICAL OBJECTS

Filed Aug. 19, 1949 6 Sheets-Sheet 1

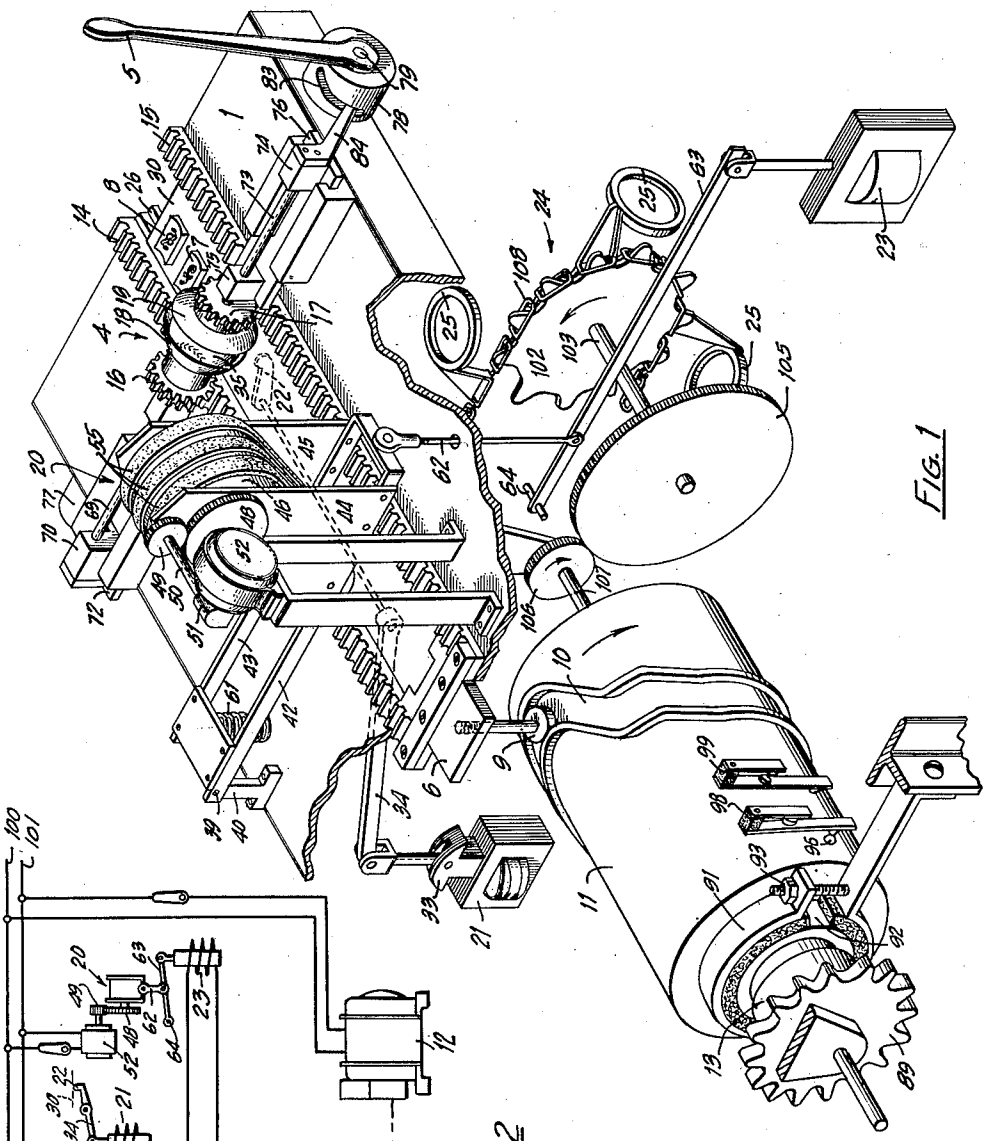


FIG. 1

FIG. 2

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MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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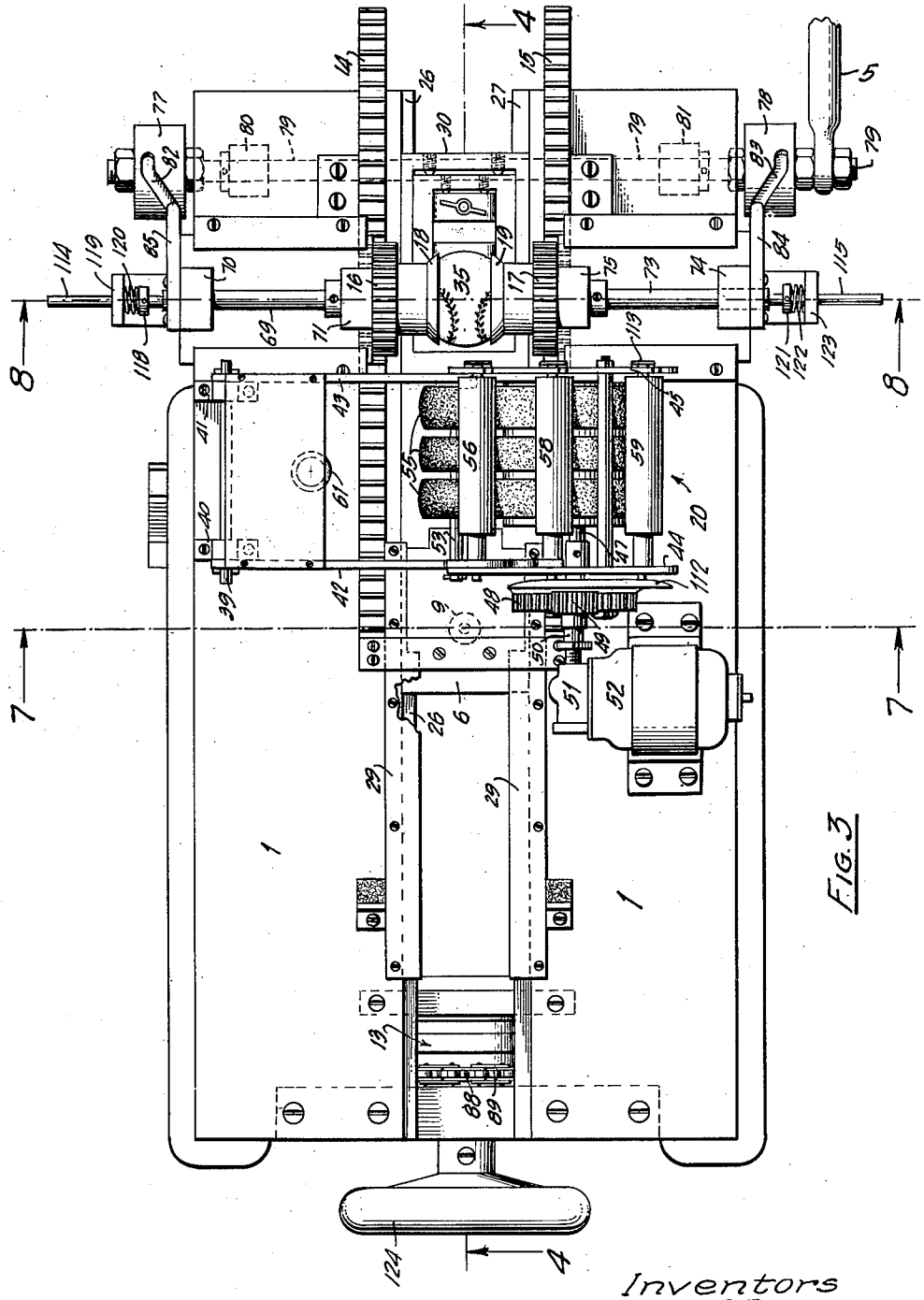


FIG. 3

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MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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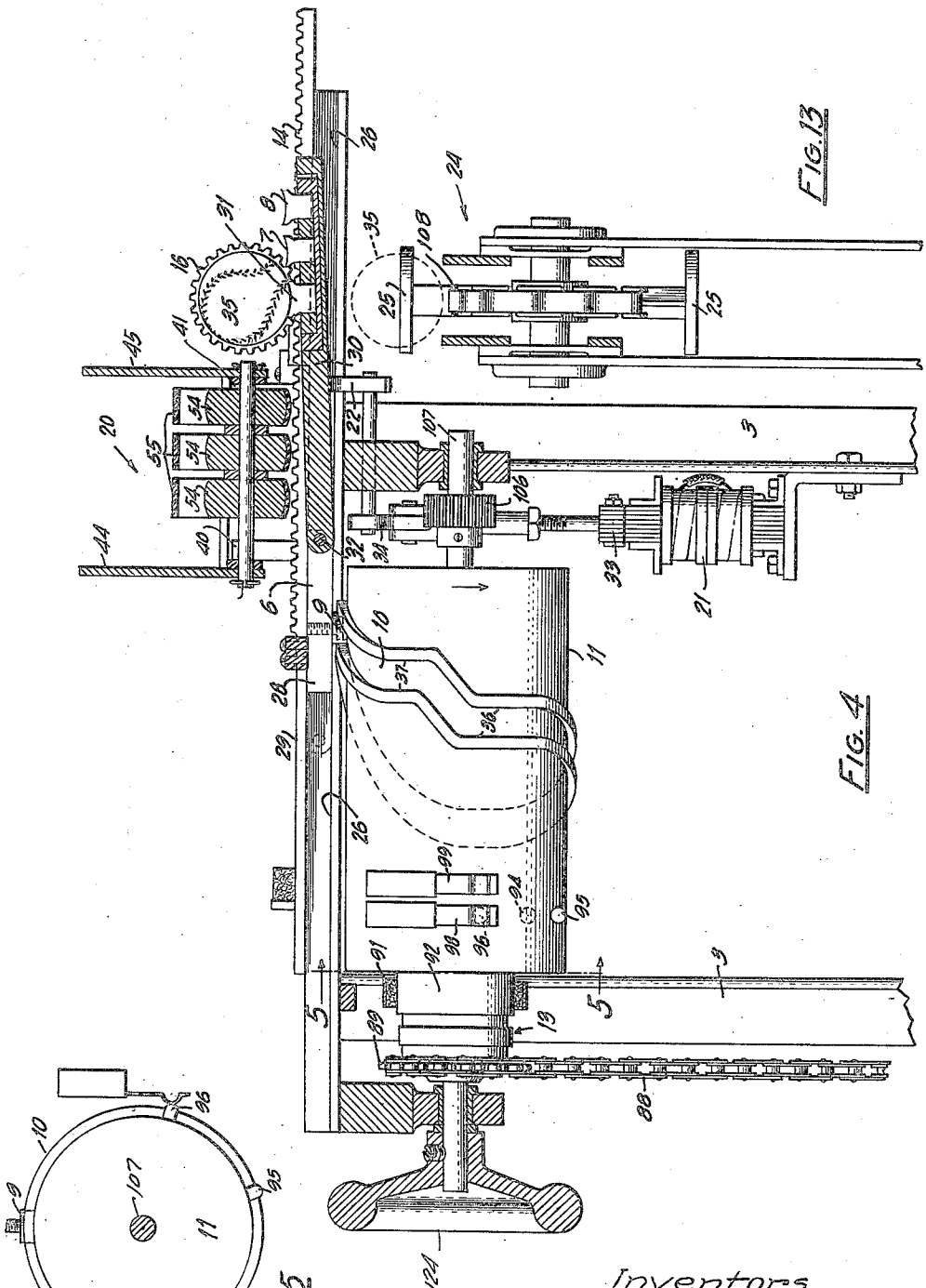


FIG. 13

FIG. 4

FIG. 5

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MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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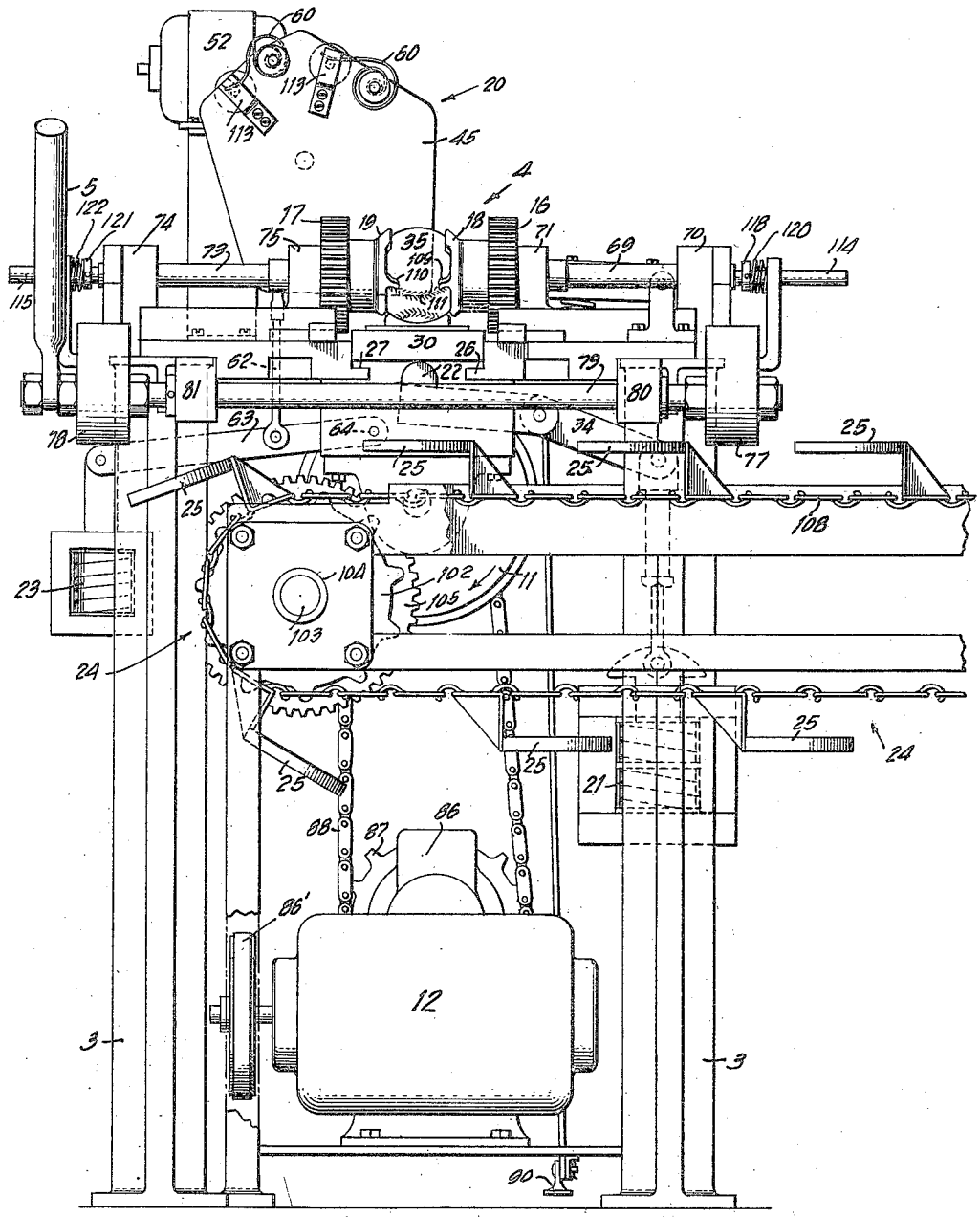


FIG. 6

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MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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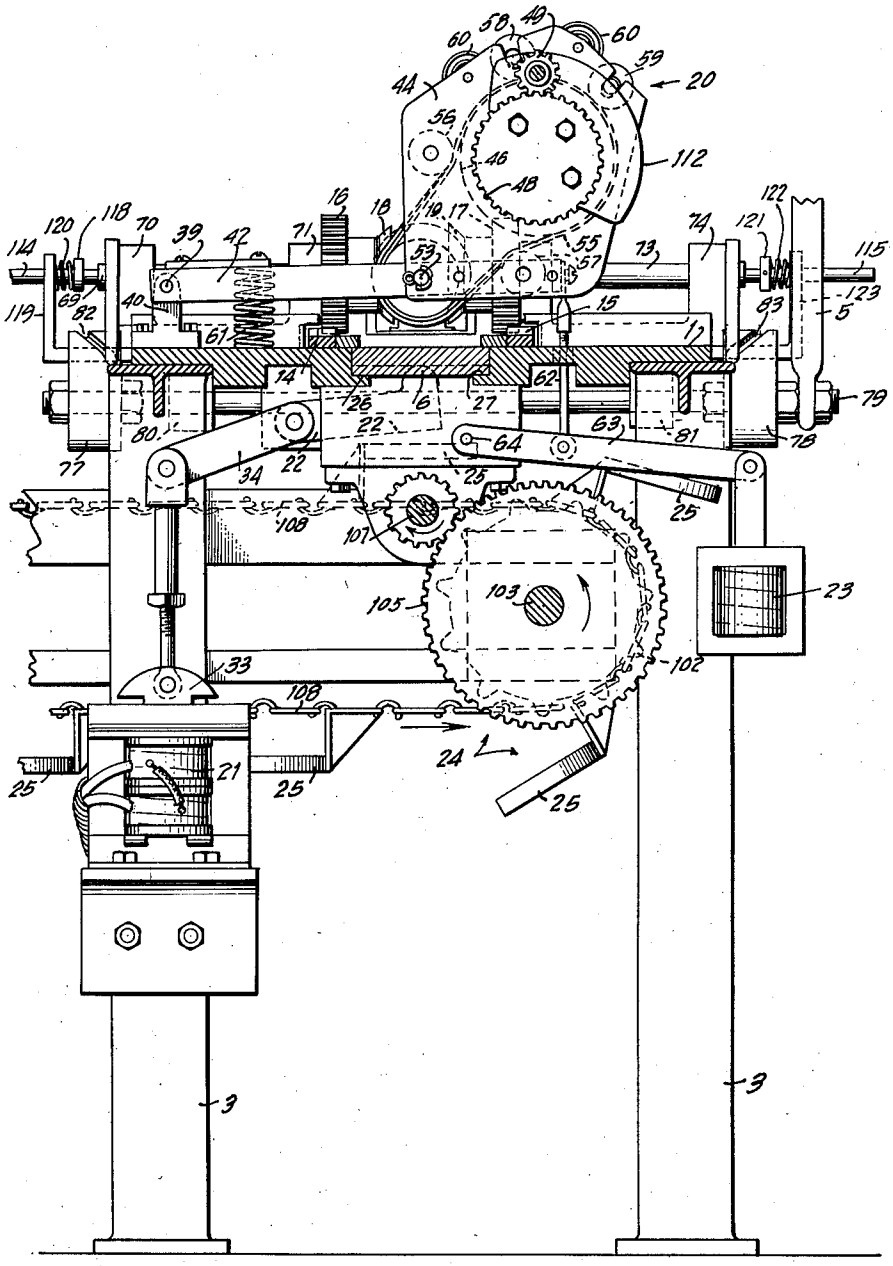


FIG. 7

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MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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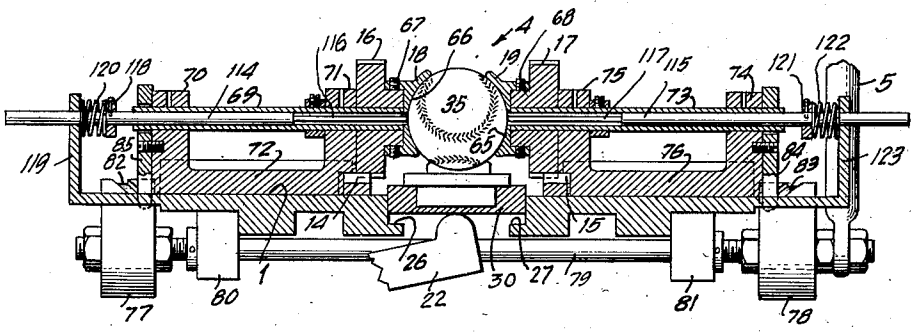


FIG. 8

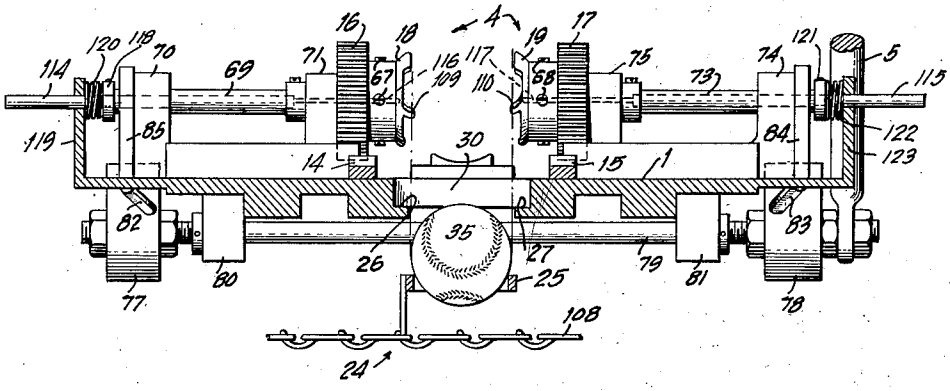


FIG. 9

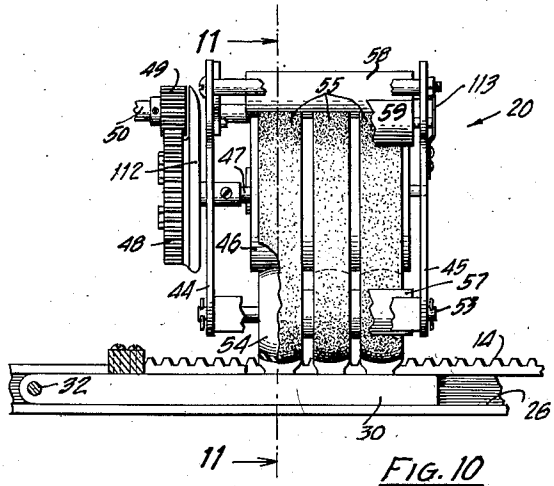


FIG. 10

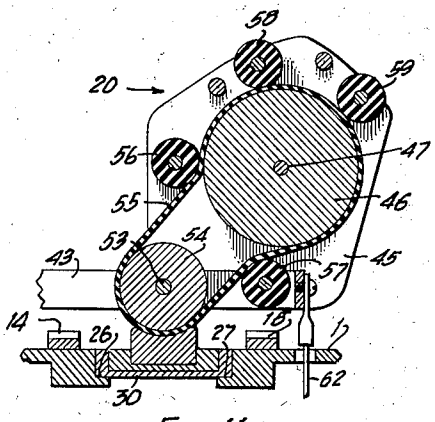


FIG. 11

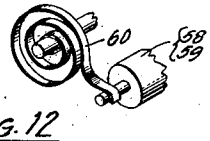


FIG. 12

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Patented Mar. 25, 1952 2,590,456

UNITED STATES PATENT OFFICE

2,590,456

MACHINE FOR PRINTING ON SPHERICAL OBJECTS

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Application August 19, 1949, Serial No. 111,278

18 Claims. (Cl. 101—44)

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Our invention relates to a machine for printing on spherical objects and particularly to a machine of this character for printing on balls such as baseballs, soft balls and the like.

So far as we are aware, the printing on baseballs and the like has heretofore usually been applied with hand stamps with the result that the printing is, in most instances, far from perfect. Furthermore, since a different printing must be applied to different zones of the balls, a plurality of hand stamps is required; the printing is a comparatively slow process; and, due to the time involved, the cost is high.

The principal object of our invention is to provide a mechanical device for printing on spherical objects, such as baseballs and the like. Another object is to provide a device of this character in which the quality of the printing is far superior to that which can be applied with hand stamps. Another object is to provide a device which, when a ball is placed therein for printing, will automatically and quickly apply the required printing to different zones of the ball. Another object is to provide, in connection with our device, a conveyor which will receive the balls as they are dropped from the device after the printing operation and carry them away while the ink thereon is drying.

We accomplish these objects by means of the novel elements and the combinations and arrangements thereof described below and illustrated in the accompanying drawing, in which—

Fig. 1 is a more or less diagrammatic perspective view, with portions broken away, of the principal features of our device;

Fig. 2 is a wiring diagram;

Fig. 3 is a top plan view of the device;

Fig. 4 is a section of Fig. 3 in the plane 4—4;

Fig. 5 is a section of Fig. 4 in the plane 5—5;

Fig. 6 is a front elevation view of the machine;

Fig. 7 is a section of Fig. 3 in the plane 7—7;

Fig. 8 is a section, with parts broken away, of Fig. 3 in the plane 8—8;

Fig. 9 is a view similar to Fig. 8 with the ball clutch open and showing a fragmentary portion of the conveyor with a baseball therein;

Fig. 10 is a side elevation view of the device for inking the stamps, with portions broken away;

Fig. 11 is a section of Fig. 10 in the plane 11—11;

Fig. 12 is a fragmentary perspective view of a detail; and

Fig. 13 is a side elevation view, partially in section, of the conveyor, and might be considered a part of Fig. 4.

Referring to the drawings and first to Fig. 1,

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for a general understanding of the device, 1 is a table top which is supported on suitable legs, such as shown at 3 in Figs. 4, 6 and 7. 4 represents generally a clutch for holding the balls to be printed and which may be thrown into or out of engagement with the ball by means of the handle 5. 6 is a slide carrying at one end stamps or electrotypes, such as shown at 7 and 8, having spherical printing surfaces of a radius equal to the radius of the balls to be printed, and bearing the matters to be printed thereon. The slide 6 is reciprocated by means of the cam follower 9 connected thereto, and which rides in the cam slot 10 in cam cylinder 11. The cylinder 11 is rotated in the direction of the arrow shown thereon by means of a motor 12, shown in Figs. 2 and 6, through a speed-reducing device, a chain and sprockets, and a one-revolution clutch represented generally at 13. Attached to the slide 6, and moving therewith, are two, parallel-disposed racks 14 and 15 which cooperate with gears 16 and 17 attached to the clutch elements 18 and 19, respectively, and which serve to turn the ball held in the clutch elements to present different surfaces thereof to the electrotypes. 20 represents generally the device for inking the types. 21 is a solenoid which serves to snap up the finger 22 into contact with a hinged portion of the slide 6 which carries the electrotypes and which serves to bring the electrotypes into printing contact with the ball. 23 is another solenoid which serves, at time spaced intervals, to pull the inking device 20 into contact with the electrotypes, and 24 represents generally a conveyor having rings 25 thereon into which the balls are dropped after they are printed and the clutch 4 is opened.

As illustrated in the drawings, the slide 6 (see Fig. 4) rides on rails 26 and 27 (see also Figs. 3, 6, 7, 8, 9 and 10). The slide 6 comprises a section 28 which is normally held to the rail 26 by an overhanging flange 29, and a section 30, bearing the electrotypes 7, 8 and 31, which is pivotally connected to the section 28, as shown at 32 in Fig. 4. When the solenoid 21 is energized, as shown in Fig. 4, the armature 33 thereof is drawn downwardly from the position shown in Fig. 1 to the position shown in Fig. 4. This pulls the lever 34 downwardly and kicks the finger 22 upwardly against the bottom of section 30 of the slide to bring the stamps, or electrotypes 8, 7 and 31, into printing contact with the ball in sequence and in the order named. In Fig. 4, the stamp 31 is shown in printing contact with a ball 35.

In order to bring the stamps in sequence into printing position with respect to a ball 35 held in the clutch, the large cylinder or cam 11, having

the cam slot 10 therein, cooperates with the follower 9 which is attached to the section 28 of the slide. The cam slot 10 is provided with the required number of dwells, such as 36 and 37 in Fig. 4, to hold the stamps, etc., momentarily beneath the ball 35 while they are being brought into printing contact with the surface of the ball by the upward movement of the finger 22, and also with another short dwell (not shown) to hold the slide stationary during the operation of the inking mechanism described below which takes place when the cam cylinder is stopped or is stopping after one revolution.

The racks 14 and 15 which cooperate with the gears 16 and 17, respectively, and which move and stop with the slide 6, turn the clutch 4, and the ball 35 therein, about the transverse, horizontal axis of the ball, and thus serve to bring different surfaces or zones of the ball, in sequence, into position to be contacted by the stamps.

In order to apply ink to the stamps between each sequence of printing operations, we provide an inking mechanism represented generally by the numeral 20; reference being had to Figs. 1, 2, 3, 7, 10, and 11 in connection with the following description.

Pivoted at 39 to uprights 40 and 41 secured to the table top 1 is a pair of spaced, parallel-disposed levers 42 and 43, having vertically-extending plates 44 and 45 secured thereto between which the inking mechanism is mounted. This mechanism, as illustrated, comprises an upper pulley 46 having an elongated cylindrical, peripheral surface and which is fixed to the shaft 47 mounted in bearings in the plates 44 and 45. Mounted on one end of this shaft is a gear 48 in mesh with a pinion 49 which is driven by a shaft 50 through a speed-reducing mechanism 51 by the motor 52.

Mounted on a shaft 53, having its axis in substantially vertical alignment with the longitudinal center line of the slide 6, and when said inking mechanism is in contact with said stamps, passing through the centers of the spheres of which the surfaces of the stamps 7, 8 and 31 are a part, are three lower pulleys 54 having spherical, peripheral surfaces, conforming in shape to the equatorial zones of the spheres of which they are a part, and which have equal radii slightly less than the radii of the balls to be printed and the radii of the spherical printing surfaces of the stamps. Connecting the pulley 46 to the pulleys 54 are three inking belts 55 formed of resilient material such as rubber or neoprene. Rubber idler rolls 56 and 57 serve to maintain the belts 55 taut and in contact with the pulleys 46 and 54.

From the foregoing, it will be apparent that the portions of the belts 55 in contact with the pulley 46, are cylindrical, but where they are in contact with the pulleys 54, the surfaces thereof are spherical in shape and of a radius substantially equal to the radius of the printing faces of the electrotypes 7, 8 and 31. Inking rollers 58 and 59 run in contact with the cylindrical portion of the belts on the pulley 46 and are held in yielding contact with the belts by means of the spiral springs 60, one of which is shown in perspective in Fig. 12, and others of which are shown in Fig. 6. Any suitable means, such as a brush, absorbent wicks or pads, for applying ink to the rollers 58 and 59 for transfer to the belts 55, may be used, but are not shown in the drawings. In order to distribute the ink uniformly over the belts, the rollers 58 and 59 are oscillated axially by a cam 112 on shaft 47 (see Figs. 3, 7 and 10) which cooperates with the ends of the shafts on which the rollers 58 and 59 are mounted; said shafts being held in contact with the cam by flat springs 113 bearing against the opposite ends of said shafts, as shown in Figs. 6 and 10.

Normally, the spherical portions of the belts on the pulleys 53 are held just above and out of contact with the printing surfaces of the stamps by means of the spring 61 shown in Figs. 1, 3 and 7. In order to bring the ink belts into contact with the stamps, the pivotally-mounted levers 42 and 43, to which the inking mechanism described above is attached, are pulled downwardly by the solenoid 23 through the rod 62 which is connected to the lever 63 pivoted to the frame of the device at 64 and connected to the armature of the solenoid 23. This downward movement of the inking mechanism pulls the gear 48 out of mesh with the pinion gear 49. The downward movement of the inking device is a very quick movement and the gear 43 can be momentarily moved out of mesh with the gear 49 without producing any harmful effect.

In order to hold the balls 35 during the printing operation, the clutch mechanism, generally designated by the numeral 4, is employed. This mechanism is well illustrated in Figs. 1, 3, 6, 8 and 9 and will now be described.

The clutch elements 17, 18 and 19 are provided with opposed, spherical, ball-engaging faces 65 and 66, and are secured to the gears 17 and 16, respectively, by set screws 68 and 67, or other suitable means. The clutch element 18 and the gear 16 are mounted on a hollow shaft 69 which in turn is mounted in bearings 70 and 71 on the sliding base 72, perhaps best shown in Fig. 1. An additional function of the hollow shaft will be explained below. The clutch element 19 and the gear 17 are mounted on a second hollow shaft 73 which is also mounted in bearings 74 and 75 on the sliding base 76.

In order to move the clutch elements 18 and 19 into and out of engagement with the ball 35, a pair of cams 77 and 78 are mounted on a transversely-extending shaft 79 which is supported in the bearings 80 and 81. The cam 77 is provided with a helical slot 82 therein and the cam 78 is provided with a helical slot 83. Cam followers 84 and 85, respectively, are attached to the bearings 74 and 70, respectively, and a cam-operating handle 5 is attached to the shaft 79. In order to disengage the clutch from the ball, the operating handle 5 is pushed in a counter-clockwise direction as viewed in Fig. 1 which causes the slides 72 and 76, to which the clutch elements are attached, to separate and release the ball. When a ball to be printed is placed between the clutch elements, they are brought into engagement therewith by pulling the operating handle 5 in a clockwise direction as viewed in Fig. 1.

In order to reciprocate the slide 6 and also to control the operation of the solenoids in proper timed relation to the various positions of the slide, the cam cylinder 11 is rotated by a motor 12 through a speed-reducing mechanism 86 (see Fig. 6) driven by a belt 86', sprocket 87, chain 88, and sprocket 89 associated with the one-revolution clutch mechanism 13. When the device is in operation, the motor is running continuously and the clutch members, one of which is understood to be associated with the sprocket 89 and the other of which is understood to be associated with the shaft 107 of the cam cylinder 11, are thrown into engagement by means of the foot pedal 90 shown in Fig. 6. The clutch mechanism causes

the cam cylinder 11 to make one complete revolution and is then automatically thrown out of engagement therewith.

One revolution clutches of the type here employed are well known in the mechanical arts and no claim is made to any novelty therein. For these reasons, no detailed description of the clutch seems necessary. However, clutches of this type are available in the open market and one type thereof is disclosed in Dickens Patent No. 2,140,737 of December 20, 1938.

In order to stop the rotation of the cam 11 substantially simultaneously with the disengagement of the driving clutch 13, a Prony brake 91 operates in frictional contact with a drum 92 on the cam cylinder 11 and applies a "drag" thereto. The pressure of said brake on the drum may be adjusted by means of the nut 93 shown in Fig. 1.

Referring now more particularly to Figs. 1, 2 and 4, the mechanism for controlling the operation of the solenoids 21 and 23 will be explained.

It will be apparent from the position of the parts shown in Fig. 4 that the slide 6 is in its furthermost position to the right and that the stamp or electrotype 31 is in contact with the ball. In Figs. 1 and 2, it will be assumed, since the section 30 of the slide 6 has not been kicked up, that the solenoid 21 has just been energized and is about to act to move the finger 22 into contact with the bottom of the section 30 of the slide to bring the stamp 31, which is not visible in Fig. 1 because it is under the ball, into contact with the ball.

To accomplish the upward movement of the section 30 of the slide 6 at the time when each of the stamps 8, 7 and 31 is precisely in the proper position with relation to the ball, the cam cylinder 11 is provided with three circumferentially-spaced projections 94, 95 and 96 which are perhaps best shown in Fig. 2, but are also shown in Fig. 4. In order to actuate the inking mechanism, when the slide 6 is fully retracted to the left from the position shown in Figs. 1 and 4, the cam cylinder is also provided with another projection 97 (see Figs. 2 and 5).

Positioned to cooperate in sequence with the projections 94, 95 and 96, is an electric switch 98 adjacent the cylindrical cam 11; positioned to cooperate with the projection 97 in a second switch 99 also adjacent the cam 11. When any of the projections 94, 95 and 96 are in contact with the resilient arm of switch 98, as shown in Figs. 1 and 2, the switch is closed which energizes solenoid 21 by connecting it to the power lines 100 and 101. The energization of solenoid 21 snaps the finger 22 up against the bottom of the hinged section 30 of the slide 6, at which time the center of one of the stamps is under the ball in the clutch 4 and lying on the arc of a circle, having its center in the axis of the pin 32 which pivotally connects the sections 28 and 30 of the slide 6 together, and which passes through the center of the ball in the clutch. The stamp is thus brought into printing contact with the ball; it being understood that the center of the ball and the center of the spherical surface of the stamp are substantially coincident when the stamp is in contact with the ball.

When the projection 97 on the cam cylinder 11 comes in contact with the resilient arm of switch 99, the switch is closed, thus energizing solenoid 23 which pulls down the inking mechanism 20 into contact with the stamps or electrotypes and applies ink thereto.

In order automatically to convey the printed balls away from the machine after each printing operation, a conveyor, represented generally at 24, is provided, and its construction will be best understood from a consideration of Figs. 1, 6 and 13.

Referring particularly to these figures, a sprocket 102 is mounted on a shaft 103 which is supported in suitable bearings in the frame of the machine; one being shown at 104 in Fig. 6. The shaft 103 has affixed thereto a gear wheel 105 which is in mesh with a spur gear 106 attached to the shaft 107 of the cylindrical cam 11. Thus, when the cam 11 is turned, the sprocket 102 is turned. Cooperating with the sprocket 102 is a conveyor chain 108 which has the ball-receiving rings 25 affixed thereto at spaced intervals such that, when the cam 11 stops rotating after each complete turn, one of the rings 25 is stopped in a position disposed vertically below the clutch 4 to receive the printed ball when it is released from the clutch. When the cam cylinder is again started to print another ball, the conveyor moves on, and, when it stops, another ring is positioned to receive said ball.

In operation, the operator faces the end of the machine at the right in Fig. 1, and shown in elevation in Fig. 6. Assuming the clutch 4 be open, a ball to be marked is placed between the clutch elements and the handle 5 is pulled in a clockwise direction, as viewed in Fig. 1, to grip the ball between the clutch elements. Where the spherical objects being marked are baseballs, the clutch elements 18 and 19 are provided with inwardly-projecting indexes or markers such as shown at 109 and 110, respectively, in Fig. 6 with which the operator may align a seam 111 of the ball 35 to insure that the proper surfaces are presented to the stamps. After the ball has been engaged by the clutch elements, the operator touches the pedal 90, shown in Fig. 6, which engages the driving clutch and starts the cam cylinder rotating. Assuming that the slide 6 is retracted to the left as far as it will go and the stamps have just been inked at the termination of the prior rotation of the cam 11, and are under the inking mechanism, the cam slot 10 cooperating with the follower 9 attached to the slide 6 moves the slide to the right until stamp or electrotype 8 is under the ball in the clutch. The first dwell in the cam then stops the forward motion of the slide and the racks carried thereby which have cooperated with the gears 16 and 17 to turn the clutch and the ball therein to present the proper surface to the electrotype 8. The projection 94 on the cam cylinder closes switch 98 energizing solenoid 21 and pushing the pivoted section 30 of slide 6 upwardly, thus bringing electrotype 8 into printing contact with the ball. When the contact 94 passes out of cooperation with the switch 98, and this is very quickly, the switch is automatically opened, the solenoid 21 is de-energized, the pivoted section 30 of the slide 6 drops back into its normal position and the cam moves the slide forwardly or to the right, as shown in Fig. 1, until electrotype 7 is beneath the ball. During this movement of the slide, the racks 14 and 15 turn the gears 10 and 17 attached to the clutch elements so that a new surface of the ball is presented to electrotype 7 when it is under the ball. At this time, another dwell in the cam slot 10 stops the motion of the slide, projection 95 closes switch 98, and the pivoted section 30 of the slide is pushed upwardly to bring stamp 7 into contact with the ball. When projection 95 passes beyond switch 98, the switch is automatically opened, the parts returned

to their initial position, and the cam 11 moves the slide forwardly and rotates the clutch 4, just as described above, until stamp 31 is in position to make a printing contact with the ball. When switch 98 opens after projections 96 pass out of contact therewith, the cam returns the slide to its starting position where there is a short dwell, and the cam cylinder stops automatically. At the beginning of the dwell, when the slide has stopped, but before the cam cylinder 11 has ceased rotating, projection 97 is brought into cooperative relation with switch 99 to close the same. This energizes solenoid 23 which pulls the inking mechanism down into contact with the electrotypes and releases it by the passing of the projection 97 beyond the switch 99 before the cam cylinder stops rotating.

Printing of the ball has now been completed and it is ready to be released from the clutch, dropped into a ring 25 of the conveyor which is now positioned immediately below the clutch, and to be carried along on the conveyor during the printing operation on the next ball.

It is important that the center of the ball, when the ball is dropped from the clutch, travel in a vertical line passing substantially through the center of the conveyor ring 25 positioned beneath. To insure this precise vertical movement of the center of the ball, we provide means for temporarily holding the ball with its center in vertical alignment with the center of the conveying ring as the clutch elements 18 and 19 are moved out of engagement with the ball and until a clear space through which the ball may fall is provided between the lower portions of the clutch elements.

Referring particularly to Figs. 8 and 9, it will be noted that there is slidably mounted in the hollow shaft 69 a rod 114, and that a similar rod 115 is slidably mounted in the hollow shaft 73. The ends of the rods adjacent the clutch elements 18 and 19 are reduced in size, as shown at 116 and 117, and the opposed, free ends thereof are in contact with the ball 35 when in the clutch. Adjustably mounted on the rod 114 is a collar 118 and compressed between the collar 118 and the abutment 119 is a helical compression spring 120. A similar collar 121 is adjustably secured to the rod 115 and a helical compression spring 122 similar to the spring 120 is compressed between the collar 121 and the abutment 123. These springs serve to maintain the opposed ends of the reduced portions 116 and 117 of said rods in contact with the ball 35, except as explained below. The function of these rods is to hold the ball precisely centered above the ring in the conveyor beneath the ball when the clutch elements 18 and 19 are withdrawn out of engagement with the ball by means of the lever 5. By means of the adjustable collars 118 and 121, the compression of the springs is balanced so that the ball is maintained as just described. Thus, as the clutch elements 18 and 19 move apart, the hollow shafts 69 and 73 on which they are mounted, slide over the rods 114 and 115, respectively, until the ends of the hollow shafts 69 and 73 contact the collars 118 and 121, respectively, whereupon the springs 120 and 121 are compressed, as shown in Fig. 9, and the ball is released to drop into the ring 25 on the conveyor.

In order to faciltate the placing of the electrotypes in the slide and the removal therefrom, a hand wheel 124 is provided for manually turning the cam cylinder 11 to move the slide to its furthermost position to the right, as viewed in Fig. 1.

From the foregoing, it will be apparent that we have provided a device which, while it has been particularly described with reference to the printing of baseballs, nevertheless may be employed for printing any spherical objects, such, for example, as oranges, grapefruit, tennis balls, and the like. All the operator has to do is to place the object to be printed within the clutch, touch the pedal 90, release the clutch after the object has been printed, which is done very quickly, and repeat the operation on the next object.

What we claim is:

1. In a device for printing on a spherical object such as a baseball; the combination with means for holding said object; of a plurality of stamps having spherical printing surfaces conforming in curvature to the surface of said object; means for applying ink to said printing surfaces; means for effecting relative movement of said object-holding means and said stamps to bring said object and each of said stamps, in sequence, into juxtaposed relation; means for effecting relative movement of said holding means and each of said stamps when in juxtaposed relation to bring said stamps into printing contact with said object; means for effecting a relative rotative movement of said holding means and said stamps between said contacts to present an unprinted surface of said object to each of said stamps; and a motor for actuating said device.

2. In a device for printing on a spherical object such as a baseball; the combination with means for holding said object; of a rotatable mounting therefor having its axis passing through the center of said object when held by said means; of a plurality of stamps having spherical printing surfaces conforming in curvature to the surface of said object; means for moving said stamps in sequence into juxtaposed relation to said object; means for moving each of said stamps, when in juxtaposed relation to said object, into printing contact therewith; means for rotating said holding means between said contacts to present an unprinted surface to each stamp; means for applying ink to each of said stamps between printing contacts thereof with said object; and a motor for actuating said device.

3. In a device for printing on a spherical object such as a baseball; the combination with means for holding said object; of a rotatable mounting therefor having its axis passing through the center of said object when held by said means; of a plurality of stamps having spherical printing surfaces conforming in curvature to the surface of said object; means for moving said stamps in sequence into juxtaposed relation to said object; a hinged mounting for said stamps; means for swinging said stamps, when in juxtaposed relation to said object, into printing contact therewith; means for rotating said holding means between said contacts to present an unprinted surface to each stamp; means for applying ink to each of said stamps between printing contacts thereof with said object; and a motor for actuating said device.

4. The structure set forth in claim 1 together with manually controlled means for putting said device into printing operation, and means for automatically stopping said device after each sequence of printing operation.

5. The structure set forth in claim 2 together with manually controlled means for putting said device into printing operation, and means for au-

tomatically stopping said device after each sequence of printing operations.

6. The structure set forth in claim 3 together with manually controlled means for putting said device into printing operation, and means for automatically stopping said device after each sequence of printing operations.

7. In a printing device for printing on the surface of a spherical object; the combination with a stamp having a concave spherical printing surface conforming to the curvature of said object; of means for applying ink to said stamp comprising a pulley with a convex peripheral surface approximating in shape the equatorial zone of a sphere of about the same size as a sphere of which said printing surface is a part; a resilient belt cooperating with said pulley and conforming in shape to the surface thereof where in contact therewith; means for applying ink to the surface of said belt; and means for periodically moving said shape-conforming portion of said belt into ink-transfer relation to said stamp.

8. In a printing device for printing on the surface of a spherical object; the combination with a stamp having a concave spherical printing surface conforming to the curvature of said object; of means for applying ink to said stamp comprising a pulley with a convex peripheral surface approximating in shape the equatorial zone of a sphere of about the same size as a sphere of which said printing surface is a part; a second pulley having a substantially cylindrical, peripheral surface; a resilient belt cooperating with said pulleys and conforming in shape to the respective peripheral surfaces thereof when in contact therewith; means for driving one of said pulleys; means for applying ink to the surface of said belt; and means for periodically moving the spherically shaped portion of said belt into ink-transfer relation to said stamp.

9. In a device for printing on the surface of a ball; the combination with a pair of clutch elements adapted to engage said ball on opposite sides thereof; of coaxial rotatable mountings for said elements; manually operable means for moving said elements into and out of clutching relation to a ball; a gear on each of said elements for rotating the same; a reciprocating element having a pair of racks thereon cooperating with said gears and movable towards and away from said clutch elements; a plurality of stamps having spherical printing surfaces conforming in curvature to the surface of said object disposed in spaced aligned relation; a carrier for said stamps and means pivotally connecting said carrier to said reciprocating element; means for moving said reciprocating element towards and away from said clutch elements to bring said stamps in sequence into close proximity to a ball held by said clutch elements; means cooperating with said carrier for swinging it towards said ball to bring said stamps into printing contact with said ball; means for automatically moving said reciprocating element to bring each of said stamps in sequence into close proximity to said ball, simultaneously rotating said clutch elements by means of said racks and gears to present an unprinted surface of said ball to each of said stamps, effecting an operation of said carrier swinging means when each of said stamps is in close proximity to said ball to bring said stamps successively into printing contact with said ball, and thereafter returning said reciprocating element to its initial position; means for automatically applying ink to said stamps when said reciprocating element is in its initial position; a motor for actuating said reciprocating element; manually operable means for putting said device into operation; and means for automatically stopping said device when said reciprocating element returns to its initial position.

10. A device for printing on a ball comprising a ball holder; a mounting therefor adapting said holder to be rotated on an axis of a ball held thereby; a plurality of stamps having spherical printing surfaces conforming in curvature to said ball; a reciprocating element carrying said stamps; a mounting on which said element is slidable back-and-forth beneath said ball with said stamps in normally closely spaced relation to said ball; means for applying ink to said stamps; a cam for moving said element back and forth on its mounting and stopping it momentarily when moving in one direction when the printing surface of each stamp is approximately concentric with said ball; means operating in timed relation with the stopping of said element for moving each of said stamps into printing contact with said ball; means cooperating with said holder and actuated by the sliding movement of said element for rotating said holder to present a selected portion of the surface of said ball to each of said stamps for printing thereon; a motor; a single revolution clutch drivingly connecting said motor to said cam and automatically disconnecting said cam from said motor after one turn of said cam; and manually operable means for putting said device in operation.

11. In a device for printing on a spherical object such as a baseball; the combination with a means for holding said object during the printing operation, of an electrotype having a spherical printing surface of a curvature conforming substantially to the curvature of the surface of said object, a resilient belt adapted to carry a film of ink on the surface thereof for applying ink to said type, a pulley having a spherical peripheral surface cooperating with said belt substantially throughout the width of said belt and of a radius approximating the radius of said spherical printing surface, means for periodically bringing said belt into ink-transferring contact with the printing surface of said type, and means for thereafter bringing said type into printing contact with said object.

12. In a device for printing on a spherical object such as a baseball; the combination with a means for holding said object during the printing operation, of an electrotype having a spherical printing surface of a curvature conforming substantially to the curvature of the surface of said object, a first pulley having a substantially cylindrical peripheral surface, a second pulley having a peripheral surface in the form of the equatorial zone of a sphere of approximately the same radius as the radius of the printing surface of said electrotype, mountings for said pulleys, a resilient belt, adapted to carry a film of ink on the surface thereof, stretched tightly around the peripheral surfaces of said pulleys and conforming to the shape of said surfaces where in contact therewith, means for periodically bringing that portion of said belt in contact with said second pulley into ink-transferring contact with said type, and means for thereafter bringing said type into printing contact with said object.

13. In a device of the character described for printing on spherical objects, the combination with a pair of clutch elements and mountings therefor upon which said elements are movable

towards each other to engage and hold one of said objects during the printing thereof, and away from each other to release said object after the printing thereof, of means for moving said elements into and out of engagement with one of said objects, a conveyor having a plurality of rings thereon each adapted to hold one of said objects when dropped therein, means for moving said conveyor and automatically stopping it with the center of one of said rings vertically below the center of an object when engaged by said clutch elements, and means cooperating with said object when engaged by said clutch elements for holding said object centered over a conveyor ring below it as said clutch elements are moved away from each other out of engagement with said object until they are entirely clear thereof, and then releasing said object to allow it to drop into the conveyor ring therebelow.

14. In a device of the character described for printing on spherical objects, the combination with a pair of clutch elements and mountings therefor upon which said elements are movable towards each other to engage and hold one of said objects during the printing thereof, and away from each other to release said object after the printing thereof, of means for moving said elements into and out of engagement with one of said objects, a conveyor having a plurality of rings thereon each adapted to hold one of said objects when dropped therein, means for moving said conveyor and automatically stopping it with the center of one of said rings vertically below the center of an object when engaged by said clutch elements, a pair of horizontal rods, one extending through each of said clutch elements and axially movable independently thereof; said rods being disposed substantially coaxial with each other and with a horizontal diameter of an object engaged by said clutch elements; resilient means yieldingly holding the opposed ends of said rods in contact with said object held by said clutch elements as said elements are moved out of engagement with said object, and means on said rods cooperating with said means for moving said clutch elements for moving said rods out of engagement with said object when said elements are entirely clear of said object to allow it to fall in a conveyor ring below.

15. In a device for printing on a ball, the combination with a clutch comprising a pair of clutch elements for holding said ball, of means for moving said elements into and out of engagement with said ball, a gear on each of said elements, a reciprocating member having racks thereon cooperating with said gears for turning said clutch elements as said member is reciprocated, a plurality of spaced stamps on said reciprocating member having spherical printing surfaces of a radius substantially equal to the radius of said ball and disposed to move in sequence past said ball in close proximity to the surface thereof as said member is reciprocated, means for reciprocating said member including means for momentarily stopping said member when moving in one direction when the printing surface of each of said stamps is approximately concentric with a ball in said clutch, and means for bringing each of said stamps into printing contact with said ball substantially simultaneously with the stoppage of said member.

16. In a device for printing on a spherical object such as a baseball, the combination with a clutch for holding said object during the printing operation, of manually operable means for moving said clutch into and out of engagement with said object, a stamp having a spherical printing surface conforming in curvature to the surface of said object, a carrier for said stamp, means for moving said carrier to bring said stamp into and out of close proximity to the surface of an object held in said clutch including means for stopping said carrier momentarily when the printing surface of said stamp is approximately concentric with said object, means, including an electromagnet, for moving said stamp momentarily into printing contact with said object when said carrier is stopped, and means for applying ink to the printing surface of said stamp between printing contacts thereof with said object.

17. In a device for printing on a spherical object such as a baseball, the combination with a clutch for holding said object during the printing operation, of manually operable means for moving said clutch into and out of engagement with said object, a plurality of stamps having spherical printing surfaces conforming in curvature to the surface of said object, a carrier for said stamps, means for moving said carrier to bring said stamps in sequence into close proximity to said object including means for momentarily stopping said carrier as the printing surface of each of said stamps becomes approximately concentric with an object held in said clutch, means, including an electromagnet, for moving each of said stamps momentarily into printing contact with said object when said carrier is stopped, means for rotating said clutch simultaneously with movements of said carrier to present a selected surface of the object held therein to each of said stamps for printing thereon, and means for simultaneously applying ink to each of said stamps after each sequence of printing operations.

18. In a device for printing on spherical objects, the combination with a clutch for holding one of said objects during the printing operation thereon and comprising a pair of clutch elements and means for moving said elements towards each other to engage one of said objects on opposite sides thereof, and away from each other to release said object, of a conveyor having a plurality of rings thereon each adapted to hold one of said objects when dropped therein, means for moving said conveyor during the printing operation on an object held in said clutch and stopping it with the center of one of said rings below and substantially in vertical alignment with the center of the object in said clutch, means independent of said clutch elements for holding said object centered over said ring as said clutch elements are moved away from each other until an unobstructed path is provided for the free fall of said object into said ring, and means actuated by the means for moving said clutch elements into and out of engagement with said object for then releasing said object to drop in said ring.

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