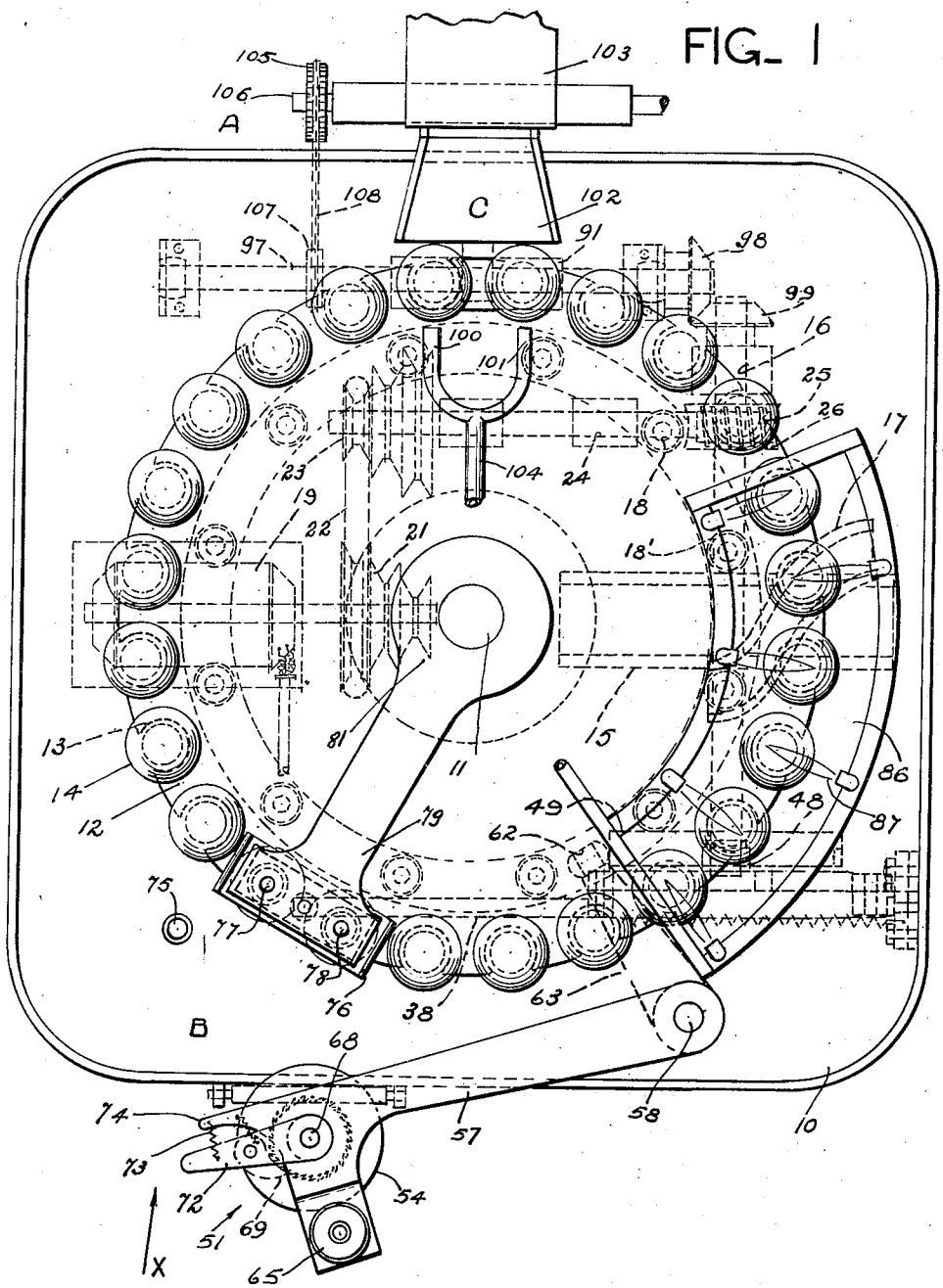
Nov. 1, 1927. **1,647,646**

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STAMP INKING DEVICE FOR ETCHING MACHINES

Filed March 10, 1926 2 Sheets-Sheet 1

FIG. 1



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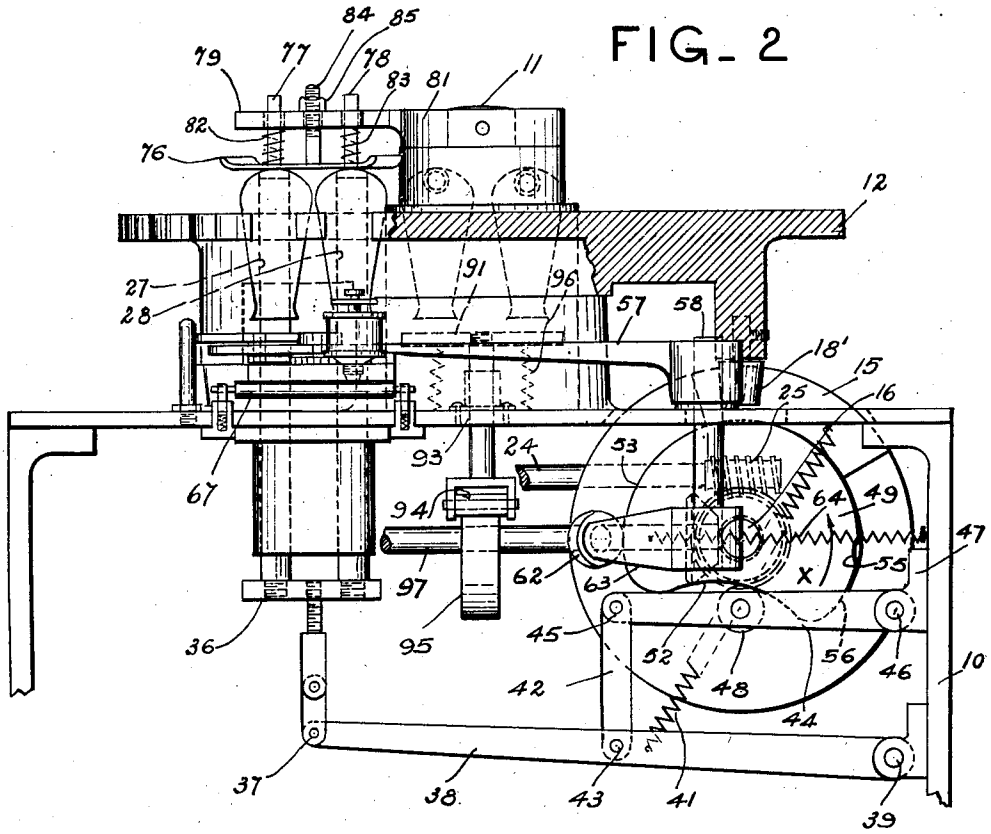
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STAMP INKING DEVICE FOR ETCHING MACHINES

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FIG_2



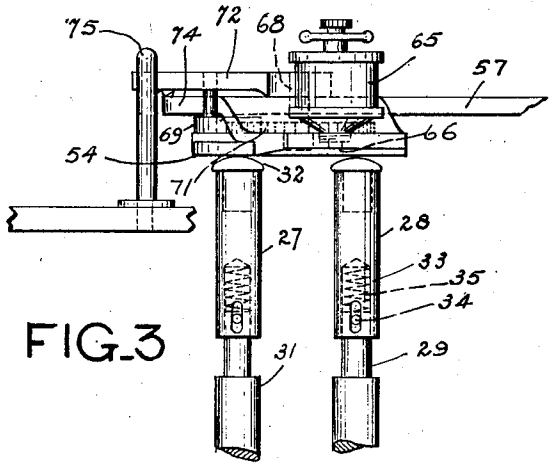


FIG_3

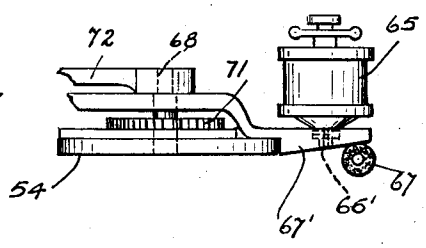


FIG_4

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Patented Nov. 1, 1927. 1,647,646

UNITED STATES PATENT OFFICE.

FREDERICK THEODORE MAY, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

STAMP-INKING DEVICE FOR ETCHING MACHINES.

Application filed March 10, 1926. Serial No. 93,572.

The present invention relates to the manufacture of radio tubes or incandescent lamps and particularly to a device for printing upon the inner surface of the bulb thereof.

In the manufacture of articles such as radio tubes or incandescent lamps, it has been found desirable to mark or print upon the inner surface of the wall of a bulb.

An object of the present invention is, therefore, to provide a machine for the application of a stamp to the inner surface of a radio tube or lamp bulb in an automatic and efficient manner.

Another object of the invention is to provide coordinating mechanical elements which will simultaneously apply stamp to a plurality of bulbs.

Another object of the invention is to expedite the manufacture of lamps or radio tubes by providing means for automatically conveying and positioning bulbs in operative relation to means for stamping a legend thereon.

Another object of the invention is to apply a stamp in an effective and rapid manner with a minimum amount of shrinkage.

Other advantages will be apparent as the description proceeds.

The bulbs upon which the present printing device operates are those of the so-called tipless type, and the stamp is applied to the inner surface of the bulb with the printing member movable upon the longitudinal axis thereof. The bulbs are moved in pairs intermittently into operative relation with a pair of printing members which operate in timed relation to a conveyor upon which the bulbs are movable. The machine indexes to position a pair of bulbs for the stamping operation, other mechanism operates to apply a suitable quantity of marking composition to the printing portions of the stamping members, and at the proper time the latter are caused to enter the bulbs, print upon the surfaces thereof and withdraw, permitting the printed pair of bulbs to move and another pair to be positioned for the printing operation. Means are also provided for discharging the bulbs from the machine.

The invention will be more fully understood by reference to the accompanying drawings in which:

Fig. 1 is a plan view of a machine embodying the present invention.

Fig. 2 is a side elevational view of the machine shown in Fig. 1, parts being shown in cross-section.

Fig. 3 is a fragmentary view looking in the direction of the arrow X in Fig. 1 but showing the arm carrying the inking mechanism positioned to ink the printing members, and

Fig. 4 is a fragmentary detail view showing a portion of the inking device and the roller for distributing ink upon the distributor plate.

The present invention is, of course, applicable to various types of machines, the one herein shown being adapted to handle bulbs as used for radio tubes. The machine may comprise a table 10 having a central shaft or pedestal 11 upon which a conveyor 12 is rotatably mounted. The conveyor shown is in the form of a circular rack having 24 notches 13 to receive bulbs 14. Mechanism for causing a complete rotation of the conveyor in twelve intermittent movements is provided and comprises a modified Geneva or barrel cam member 15. This member is mounted on a horizontal shaft 16 and includes a slotted guide piece 17 adapted to engage with studs 18 provided with rollers 18' suitably positioned upon the under side of the conveyor 12. As the member 15 rotates with the shaft 16, the guide piece engages a roller causing it to traverse the guide 17, thus driving the conveyor $\frac{1}{12}$ of a revolution. Mechanism to be presently described for performing the inking operation is also driven by its connection with the shaft 16. Any suitable mechanism may be employed for driving the said shaft and as shown a motor 19 is provided, having its shaft equipped with cone pulleys 21 connected by a belt 22 to cone pulleys 23 on a countershaft 24. This countershaft is provided with a worm 25 in mesh with a worm wheel 26 secured to the shaft 16, thus motion is translated from the motor to the shaft 16 and to the conveyor. Bulbs may be loaded to the machine at "A" and intermittently moved by means of the conveyor to position "B" at which station the printing operation is performed upon the bulbs. Means for stamping or printing upon the inner surfaces of the bulbs may comprise a pair of printing members 27 and 28 mounted at the upper ends of rods 29 and 31 respectively. Each printing member may comprise a resilient pad 32 secured to one end of a

hollow sleeve 33, slidable upon the upper end of the rods 29 and 31. Each sleeve may have a pin and a slot connection 34 with the rod, and a spring 35 may be interposed between the upper end of the rod and an end of an aperture in the sleeve to permit a slight movement of the printing members 27 and 28 to give a resilient contact of the printing during the printing operation.

The rods 29 and 31 are carried on a crosshead 36 having a pivoted connection 37 to an arm 38 which in turn is pivoted at 39. A spring 41 having one end secured to the arm and its opposite end secured to the table serves to normally move the arm upwardly to carry the printing members in contact with the inner surfaces of the bulbs. For the purpose of causing a downward movement of the printing members, the arm 38 is provided with a link 42 pivoted to the arm 38 at 43 and to a supplemental arm 44 at 45. The arm 44 may be rockable about a shaft 46 in a bearing 47 secured to the table 10. The supplemental arm 44 is provided with a projecting roller 48 engageable with a surface of a cam 49 secured to and movable with the shaft 16. The cam 49 is of such configuration that a rotation thereon causes the arm 38 to move and lower the printing members below an inking device designated as a whole by the numeral 51. When the roller 48 is upon a concave surface 52 of the cam, the printing members engage with the inner surface of the bulb. As the cam rotates in the direction of the arrow X, and the roller reaches the surface 53, the printing members are moved below the surface of an ink distributing plate 54 of the inking device 51. A continued movement of the cam 49 causes the roller 48 to enter a depression 55 in the cam, thus permitting the printing members to make contact with the under side of the distributor plate 54.

The printing members are, however, again moved from contact with the distributor plate by reason of the cam surface 56 which engages the roller 48, thus holding the inking members away from the plate and ready to enter the bulbs and perform the printing operation. It will be obvious that before the printing members can move upwardly, the inking device must be moved out from the path of movement of the printing members. This is accomplished by means of an arm 57 secured to a vertical shaft 58 and having the printing device mounted at the free end thereof. A horizontal oscillatory movement is imparted to the arm 57 by means of the cam 49 by reason of a roller 62 at one end of an arm 63 secured to lower end of the shaft 58. The various machine elements for operating the printing device and for moving the inking device are so proportioned that the cam depression 52 and the cam surface 53 of the cam 49 serve as common means for causing the timed relative movement of the said device.

A movement of the cam 49 causes an oscillatory movement of the arm 63 which is normally held in contact with the cam surface by spring 64 secured to the arm and to the table 10. A movement of the arm 63 results in a similar movement of the arm 57 and the cam surface is so formed as to hold the inking device in a position beneath the printing members when the same are in position to receive ink and to move the device outwardly from the machine to the position shown in Fig. 1 when the printing operation is being performed. As will be noted, the cam member 49 is provided with a slight depression 55 for the purpose of causing a momentary upward movement of the printing members when the roller 48 traverses such depression. Inasmuch as the cam 49 is also employed to move the roller 63 which actuates the inking device, the effected surface of the cam 49 is only provided with the depression 55 at one side thereof so that the roller 62 may traverse an even surface of the cam and thus avoid being actuated by the said depression 55. Even though a slight actuation were caused by the passage of the roller 62 over the depression 55, no material disadvantage would follow in the operation of the machine.

Ink may be supplied to the distributor plate 54 from a container 65, one end 66 of which is provided with a restricted opening 66′ to the bottom surface of an extension of the arm 57 having an inclined surface 67′. Ink issuing from the opening 66′ is carried from the inclined surface of the extension 67′ across the plate 54 by means of a roller 67, resiliently mounted on the table of the machine and in the path of movement of the inking device. As the arm 57 moves the inking device to position for the application of ink to the printing members, the roller 67 is disposed in contact with the plate and carries ink from the aperture 66′ entirely across the plate 54. In order to uniformly distribute the ink upon the plate 54, it is found desirable to intermittently rotate the plate and the same is, therefore, mounted on a shaft 68 journaled in the arm 57 and adapted to be rotated by means of a pawl 69 and ratchet wheel 71. The ratchet wheel is secured to the upper side of the plate 54 and the pawl is carried at the end of a pin projecting downwardly from an arm 72 secured to the shaft 68. The arm 72 is normally held to dispose the pawl in an operative position by reason of a spring 73 secured to a projection 74 on the arm 57 and to the lever 72. The lever 72, however, extends outwardly and as the arm 57 moves the inking device to position for supplying ink to the printing members, the said arm engages with a post 75 secured to the

table 10 and thus causes an actuation of the pawl and ratchet to move the plate 54 a portion of a revolution, thus always presenting a new surface to the inking members and assuring the application of a uniform, even supply of ink thereto.

The deposit of ink to the inner surface of bulbs must be performed in a firm and positive manner and means are, therefore, provided for resiliently holding the bulbs against vertical movement. This means may comprise a stop plate 76 carried on pins 77 and 78, movable in suitable apertures provided in an extension 79 and having a hub 81 secured to the central shaft 11. The pins 77 and 78 may be provided with springs 82 and 83 disposed between stop plate and the extension thus providing a cushion for the stop plate upon the upper surface of the bulb. The stop plate 76 is held from downward movement by a center supporting rod 84 extending through an aperture in extension 79 and having a nut 85 to hold the stop plate in proper position for engagement with upper portions of the bulb. The stop plate 76 is provided with curved or flared ends and the plate may be normally positioned slightly below the top surface of the bulbs and thus be resiliently engaged thereby when the bulbs are moved to position for the inking operation. After a pair of bulbs have been stamped and the machine continues to operate, the bulbs are moved through a heat-zone 86 created in the usual manner by burners 87.

As the bulbs are moved to position C, means are provided for the discharge from the machine. Any suitable mechanism may be provided for this purpose and the drawing illustrates a lifter 91 (see Fig. 2) reciprocable in a guide 93 and having a roller 94 at its lower end. The roller may be normally maintained in contact with a cam 95 through the action of springs 96, the cam being secured to a shaft 97 carried in suitable bearing beneath the table 10. As illustrated, motion is transmitted to the shaft 97 by reason of its association with the shaft 16. The said connection may comprise a pair of bevel gears 98 and 99. The lifter plate is arranged to move upwardly during each stationary stage of the conveyor and thus lift a pair of bulbs to position for discharge from the notches 13. When so positioned, a jet of air projected from nozzles 100 and 101 cause and effect a movement of the bulbs into a guide 102 which is inclined downwardly, permitting the bulbs to become disposed upon a belt conveyor 103. The air jets for discharging the bulbs may be provided by connecting a supply pipe 104 with any suitable air pressure line (not shown). The conveyor or belt 103 may be driven by means of a chain drive comprising a sprocket wheel 105 and a shaft 106 constituting part of the conveyor and a sprocket wheel 107 secured to and rotatable with the shaft 97. The chain 108 which leads over the sprocket wheels 105 and 107 serve to transmit motion to the shaft 106 and thereby cause a movement of the conveyor to transport lamps from the machine to any suitable receptacle or to another machine for further operations. It will be evident that by reason of the present machine, bulbs may be stamped with any suitable marking in any rapid and efficient manner.

Although a practical embodiment of the invention is shown and described in connection with the marking of bulbs for radiotrons, it will be evident that hollow articles of various contour may be marked or printed upon and that various modifications may be made in the machine without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A bulb printing machine comprising a conveyor for supporting a plurality of bulbs, a printing member, an inking device, means for reciprocating said printing member for contact with a wall of a bulb, means for actuating said conveyor to successively position bulbs for the entrance of said printing member therein for a printing operation and means for causing a relative movement between said printing member and said inking device to supply ink to said member with each reciprocatory movement thereof.

2. A bulb printing machine comprising a conveyor for supporting a plurality of bulbs, a printing member, an inking device, means for moving said conveyor to position bulbs successively in operative relation to said printing member, means for moving said inking device into the path of movement of said printing member and a common means for actuating said printing member for application of ink thereto, and for moving said inking device to permit said member to make contact with the inner wall of a positioned bulb.

3. A bulb printing machine comprising a carrier for a plurality of bulbs, a printing member, means for moving a bulb in position for the entrance of said printing member therein, means for moving said printing member a predetermined distance away from said bulb, an inking device, means for positioning said inking device between said printing member and bulb, common means for actuating said printing member for application of ink thereto from said inking device, and for moving said inking device, and means for actuating said printing member to make contact with the inner wall of said bulb.

4. A bulb printing machine comprising a

bulb carrier, a printing member, means for actuating said carrier to position a bulb for the entrance of said printing member therein, means for moving said printing member away from said bulb, an inking device, common means for actuating said device to position the same in the path of movement of said bulb, and for causing a reciprocatory movement of said printing member for application of ink thereto, means for removing said inking device, and means for causing said printing member to make contact with the wall of said bulb.

5. A bulb printing machine comprising a printing member, a bulb carrier, an inking device, means for causing a relative movement between said member and said inking device to apply ink to said member, means for actuating said carrier to position a bulb for the entrance of said printing member therein, and means for actuating said member to make contact with the inner wall of said bulb.

6. A bulb printing machine comprising a printing member, a bulb support, an inking device, means for reciprocating said member through a given path to print upon the inner wall of said bulb, common means operable during the movement of said member in one direction to position said inking device in the path of movement of said member for the application of ink thereto, and for removing said inking device to permit a movement of said member to print upon the inner wall of said bulb.

7. A bulb printing machine comprising a conveyor for supporting bulbs, means for moving said conveyor intermittently, an inking device, a printing member, common means for reciprocating said printing member in timed relation with the intermittent movement of said conveyor to cause the printing member to make contact with a wall of a bulb, and for disposing of said device in the path of movement of said printing member for the application of ink thereto and for causing the movement of said inking device away from said member.

8. A bulb printing machine comprising a conveyor for supporting a bulb, a printing member, means for reciprocating said member through a given path, an inking device movable to and from the path of movement of said printing member and a common means for positioning said inking device in the path of movement of said printing member for application of ink thereto, for removing said device and for causing a reciprocation of said printing member.

In testimony whereof, I have hereunto subscribed my name this 9th day of March, 1926.

FREDERICK THEODORE MAY.