

March 8, 1927.

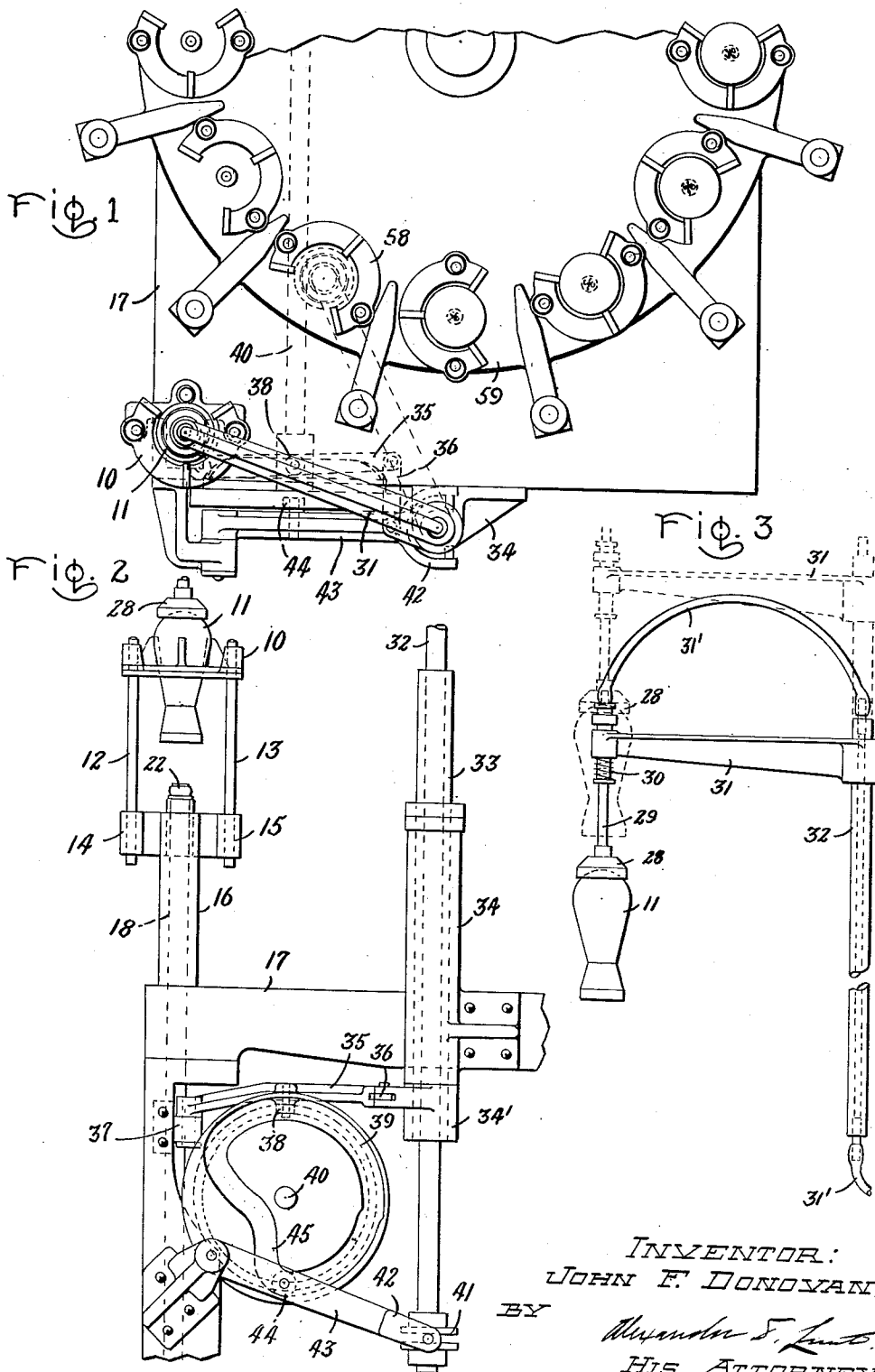
J. F. DONOVAN

1,620,447

APPARATUS FOR MAKING INCANDESCENT LAMPS AND SIMILAR ARTICLES

Filed April 9, 1925

2 Sheets-Sheet 1



INVENTOR:
JOHN F. DONOVAN,
BY *Alexander S. Lunt*
HIS ATTORNEY.

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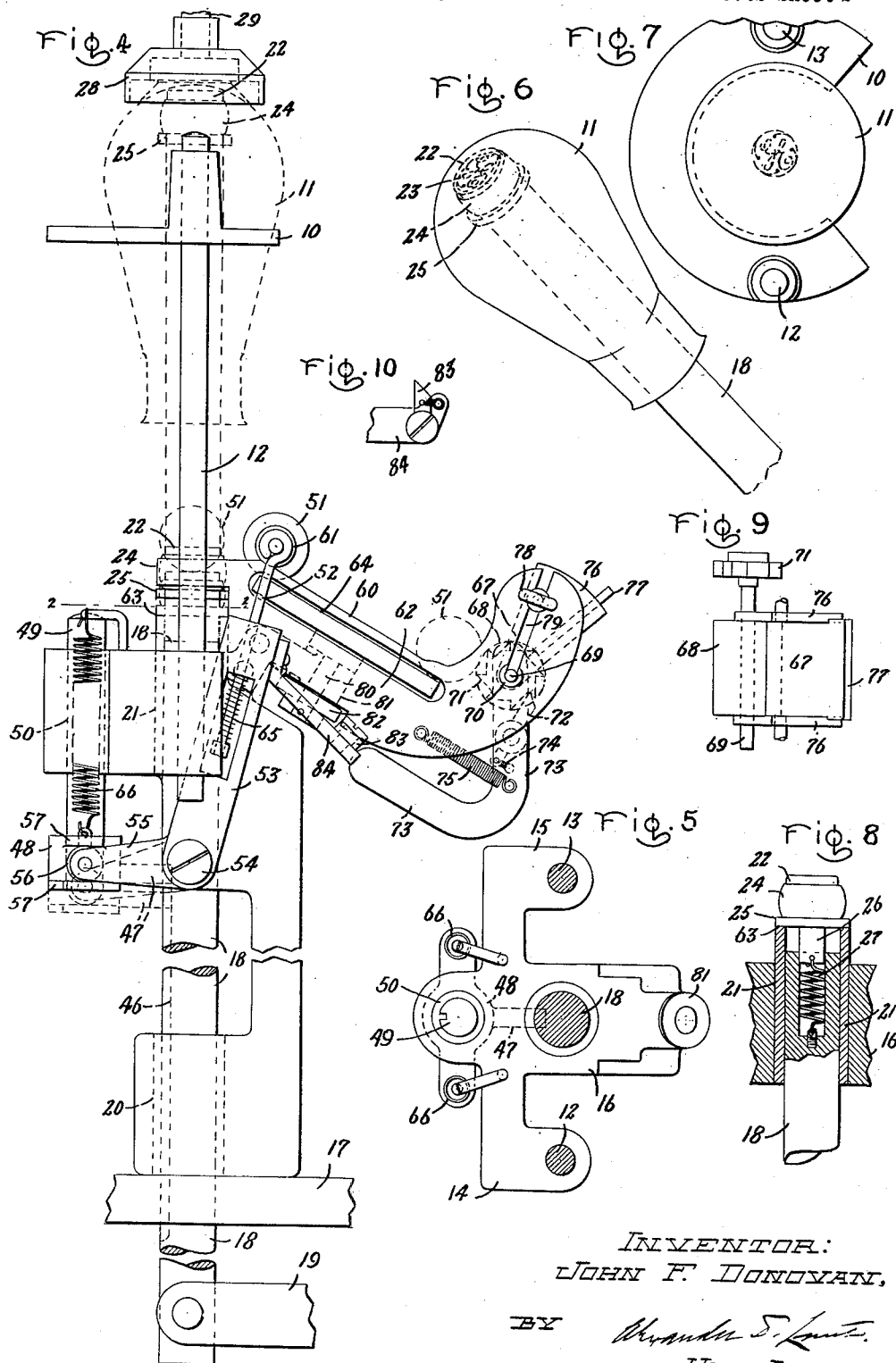
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APPARATUS FOR MAKING INCANDESCENT LAMPS AND SIMILAR ARTICLES

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2 Sheets-Sheet 2



INVENTOR:
JOHN F. DONOVAN,

BY *Wm. S. Lunt.*
HIS ATTORNEY.

Patented Mar. 8, 1927.

1,620,447

UNITED STATES PATENT OFFICE.

JOHN F. DONOVAN, OF EAST CLEVELAND, OHIO, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

APPARATUS FOR MAKING INCANDESCENT LAMPS AND SIMILAR ARTICLES.

Application filed April 9, 1925. Serial No. 21,952.

My invention relates to printing machines and more particularly to machines adapted to print upon articles such as glass bulbs. It is especially designed for printing monograms upon the inner or concave surface of incandescent lamp bulbs and similar hollow glass articles. According to my invention, I provide a standard which is supported by a table or base and which carries an adjustable bulb holder. The standard also carries the inking mechanism and acts as a bearing and guide for a reciprocating printing means. My invention also includes the combination of a printing machine with another machine for making lamps or other articles comprising bulbs, and the means for transferring said articles from the printing machine to the other machine. In the drawing is shown the combination of the printing machine with an incandescent lamp sealing and exhausting machine of the type disclosed in the application of Patterson, Serial No. 708,240, filed April 22, 1924.

My invention will be more clearly understood by referring to the accompanying drawings in which Fig. 1 is a fragmentary plan view of the combination of a printing mechanism and an incandescent lamp sealing and exhausting machine; Fig. 2 is a partial side elevation thereof; Fig. 3 is a side elevation of a portion of the transferring mechanism; Fig. 4 is an enlarged side elevation of my improved printing means; Fig. 5 is a horizontal section along the line 2—2 of Fig. 4; Fig. 6 is a perspective of an incandescent lamp bulb having a portion of the monogramming device inserted therein; Fig. 7 is a plan view of an incandescent lamp bulb and holder therefor; Fig. 8 is a fragmentary section of the upper end of the stamp; Fig. 9 is a plan view of the ink fountain; and Fig. 10 is a detail of the disc ratchet operating pawl.

As shown in Figs. 1, 2 and 4, my invention comprises a holder 10 shaped to receive a bulb 11 and maintain it in vertical position.

The said holder is adjustably mounted on the vertical rods 12—13 which are supported in the arms 14—15 forming part of a standard 16 supported upon the base or table 17 which forms part of an incandescent lamp sealing-in and exhausting machine. A rod 18 which is reciprocated vertically by means of a cam (not shown) through the lever 19 slides in the bearings 20—21 (Fig.

4) carried by the standard 16. At the upper end of the rod 18 is located a rubber imprinting stamp 22 having thereon the desired character or design 23, said stamp being attached to a cushion 24 preferably of rubber. The cushion 24 is carried by a plate 25 which has an extension 26 fitting slidably in the rod 18. A spring 27 is attached to the extension 26 and to the rod 18 and tends to hold the plate 25 normally against the top of the rod 18. After a bulb 11 has been placed in the holder 10, it is necessary that the bulb be held firmly while the rod 18 moves upward to print the design or character upon the inner surface thereof. This is accomplished by means of a gripping member such as a vacuum cup 28 which is shaped so as to make an air tight joint with the upper end of the bulb. The vacuum cup 28, in the species of the invention shown in the drawing, forms part of a mechanism which transfers the bulb from the holder 10 of the printing mechanism to the sealing-in machine. This cup 28 is attached to the end of a tube 29 (Fig. 3) which is carried by a sleeve 30 slidably mounted in a bearing in a horizontal arm 31 forming part of the transfer mechanism. The cup 28 is actuated in any suitable way to grip and release the bulb at definite times during the movement of the transfer mechanism. For example, it is brought into engagement with a bulb 11 and is then connected to a vacuum pump (not shown) through the connections 31', the vacuum being sufficiently great to enable the cup to lift the bulb 11 out of the holder 10 and to hold it as long as the said vacuum is maintained. As shown in Figs. 1, 2 and 3, the transfer arm 31 is attached to a hollow shaft 32 fastened to a sleeve 33 mounted in the bracket 34 attached to the table 17. The bracket 34 permits the transfer arm 31 to rotate about the vertical axis of the shaft 32 and to be raised and lowered. The said arm 31 is rotated by means of a collar 34' which is keyed to the lower end of the shaft 32, said collar being connected to a movable arm 35 through the link 36. The arm 35 is pivotally mounted in a bracket 37 and carries a roller 38 which rides on a cam 39, said cam being mounted upon a driving shaft 40. The transfer arm is raised and lowered by means of a collar 41 engaged by a fork 42 on one end of a pivoted lever 43 which carries a roller 44

arranged to follow a groove 45 in the cam 39.

When the rod 18 is in its uppermost position, as shown in dotted lines in Fig. 4, the design or character is imprinted upon the bulb 11. Located in the rod 18 is an elongated slot 46 which receives a finger 47 extending from a lug 48 fastened to the end of a vertical shaft 49 slidably mounted in a bearing 50 formed in the standard 16. Ink is supplied to the imprinting stamp 22 by means of an ink transferring roller 51 rotatably supported on the arms 52 slidably mounted in the rocker arms 53 which are pivotally mounted at 54 on the standard 16. The extensions 55 of the rocker arms 53 have attached thereto the rollers 56 which are carried between the cars 57 extending from the lug 48.

After an impression is made upon the bulb 11, the cam 41 raises the transfer arm 31 thereby lifting the bulb out of the holder 10. The transfer arm 31 is then rotated about its axis, thereby bringing the bulb over one of the holders 58 of the sealing-in machine 59 where it is lowered into position whereupon the vacuum supply is closed between the connections 31' and the cup 28 causing the cup to release the bulb. In the meantime the rod 18 starts on its downward movement and at a certain point in its travel the end of the slot 46 comes in contact with the finger 47. The rod 18 continues downward carrying with it the finger 47 and the lug 48 which in turn carries the extensions 55 downward thus rotating the rocker arms 53. This causes the ink transferring roller 51 to travel toward the rod 18 over the tracks 60 by means of the rollers 61 riding thereon, the tracks 60 being formed by the top of the supports 62 which are attached to the standard 16. As the rod 18 continues downward the plate 25 comes in contact with a stop 63 formed by the top of the bearing 21 thus holding the stamp 22 stationary while the rod moves downward a short distance in order that the ink transferring roller 51 may be drawn over the surface of the distributing disc 64 and stamp 22. Springs 65 which surround the rods 52 tend to keep the roller 51 in contact with the ink distributing disc 64 and stamp 22.

The stamp 22 having been supplied with ink, the rod 18 starts on its upward stroke, thus releasing the finger 47, which is drawn upward by the springs 66 fastened to the lug 48 and standard 16 causing the transferring roller 51 to travel back toward the ink fountain 67. The rod 18 moves upward a short distance where it again picks up the stamp 22 by raising the plate 25 from the stop 63 and continues upward with the stamp 22 until another impression is made. Ink is supplied to the ink transferring roller 51 from the ink fountain 67 by means of the fountain roller 68, which is mounted on a shaft 69 and rests in the bearings 70 carried by the supports 62, and has a ratchet wheel 71 attached to one end of the shaft 69. The ratchet 71 is driven by a pawl 72 pinned to an arm 73 carried on the end of the shaft 69. A spring 74 fastened on the arm 73 and bearing against the pawl 72 tends to keep the pawl in contact with the ratchet 71. The pawl 72 is driven by one of the rocker arms 53 on its travel toward the fountain roller 68 striking against the arm 73 thus causing the pawl 72 to advance the ratchet 71 and rotate the fountain roller 68. The arm 73 is moved against the action of the spring 75, said spring being attached to the arm 73 and support 62. The arm 73 remains in the out position until pressure from the rocker arm 53 is released at which time the arm 73 is drawn back by the action of the spring 75. This causes the pawl 72 to retreat over a tooth of the ratchet 71 and engage another tooth thereof. By the rotation of the fountain roller 68 a supply of ink is transferred from the ink fountain 67 to the transferring roller 51. The ink fountain comprises the two side members 76 which are loosely mounted on the shaft 69 and a back member 77 which is fastened between the side members 76. Adjustment of the fountain roller 68 is secured by means of the thumb screw 78 carried by the side members 76 and slots 79 located in the supports 62.

The ink distributing disc 64 is fastened to the shaft 80 which is mounted in the bearing 81 extending from the standard 16. The disc 64 is given a rotary motion in order that ink may be properly distributed upon its surface and also upon the surface of the ink transferring roller 51, such motion being obtained by means of a ratchet 82 fastened to the shaft 80 and operated by a spring controlled pawl 83 (Fig. 10) pivotally mounted on the pawl support 84 carried by one of the rocker arms 53. As the ink transferring roller 51 travels from the fountain roller 68 and over the disc 64, the pawl 83 strikes the ratchet 82 which in turn rotates the disc 64 through the shaft 80.

In operation a bulb is placed in the holder 10 whereupon the cup 28 is lowered to a position where it can conveniently hold the bulb. The rod 18 then starts upward and at the end of its stroke contacts with the inner concave surface of the bulb to imprint thereon the design of the stamp 22. Vacuum is applied to the interior of the cup 28 to enable it to grip and hold the bulb while it is lifted from the holder 10 and transferred to one of the holders 58 of the sealing-in machine. During this period the rod 18 starts on its downward movement, and at a certain point in its travel the lug 48 is caused to move down against the action of the springs 66 by means of the finger 47 coming in con-

tact with the end of the slot 46 in the rod 18. As the lug 48 moves downward it carries with it the extensions 55 of the rocker arms 53, causing them to rotate about their pivots 54 thus carrying the ink transferring roller 51 from the ink fountain 67 over the disc 64 toward the rod 18. As the rod 18 moves downward the plate 25 strikes the stop 63 causing the stamp 22 to be held stationary while the rod 18 continues downward in order that the ink transferring roller 51 may be drawn over the surface of the stamp 22. As the rod 18 starts upward, the finger 48 is released from the end of the slot 46 causing the transferring roller 51 to be returned to the ink fountain 67 by means of the springs 66. The rod 18 continues upward a short distance until it comes in contact with the bottom of the plate 25 thus raising the stamp 22 upward so as to imprint another bulb.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination of a machine for printing a mark on bulbs, a second machine for performing another operation on said bulbs, a transfer mechanism comprising means for automatically removing bulbs from said printing machine and delivering them to said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof contacts with said bulb during the printing operation.

2. The combination of a machine for printing a mark on the inside of bulbs, a second machine for performing another operation on said bulbs, a transfer mechanism comprising means for automatically removing bulbs from said printing machine and delivering them to said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof contacts with said bulb during the printing operation.

3. The combination of a machine for printing a mark on bulbs and comprising a holder for receiving said bulbs one by one, a second machine for performing another operation on said bulbs, a transfer mechanism comprising means for automatically removing bulbs from said printing machine and delivering them to said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof contacts with said bulb during the printing operation.

4. The combination of a machine for printing a mark on bulbs and comprising a holder for receiving said bulbs one by one

and supporting each in a substantially vertical position, a second machine for performing another operation on said bulbs, a transfer mechanism comprising means for automatically removing bulbs from said printing machine and delivering them to said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof contacts with said bulb during the printing operation.

5. The combination of a machine for printing a mark on the inside of bulbs and comprising a holder for receiving said bulbs one by one and supporting each in a substantially vertical position, a printing stamp and means for reciprocating the same through said holder into said bulb, a second machine for performing another operation on said bulbs, a transfer mechanism comprising means for automatically removing bulbs from said printing machine and delivering them to said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof is in contact with the top of said bulb when said stamp engages the same.

6. The combination of a machine for printing a mark on bulbs and comprising a holder for receiving said bulbs one by one and supporting each in a substantially vertical position, a second machine for performing another operation on said bulbs and comprising similar holders, a transfer mechanism automatically operated to remove said bulbs from said printing machine holders and deliver them to the holders of said second machine and means whereby the operation of said transfer mechanism is timed so that a portion thereof is in contact with a bulb during the printing operation.

7. The combination of a machine for printing a mark on bulbs and comprising a holder for receiving said bulbs one by one and supporting each in a substantially vertical position, a second machine for performing another operation on said bulbs and comprising similar holders and a transfer mechanism automatically operated to remove said bulbs from said printing machine holders and deliver them to the holders of said second machine and comprising a vacuum cup and means for causing the same to engage each bulb during the printing operation and to release it after it has been delivered to the second machine.

In witness whereof, I have hereunto set my hand this 6th day of April, 1925.

JOHN F. DONOVAN.