Dec. 2, 1941. R. M. GARDNER 2,264,304

LAMP BASING MACHINE

Filed Sept. 27, 1940 3 Sheets-Sheet 1

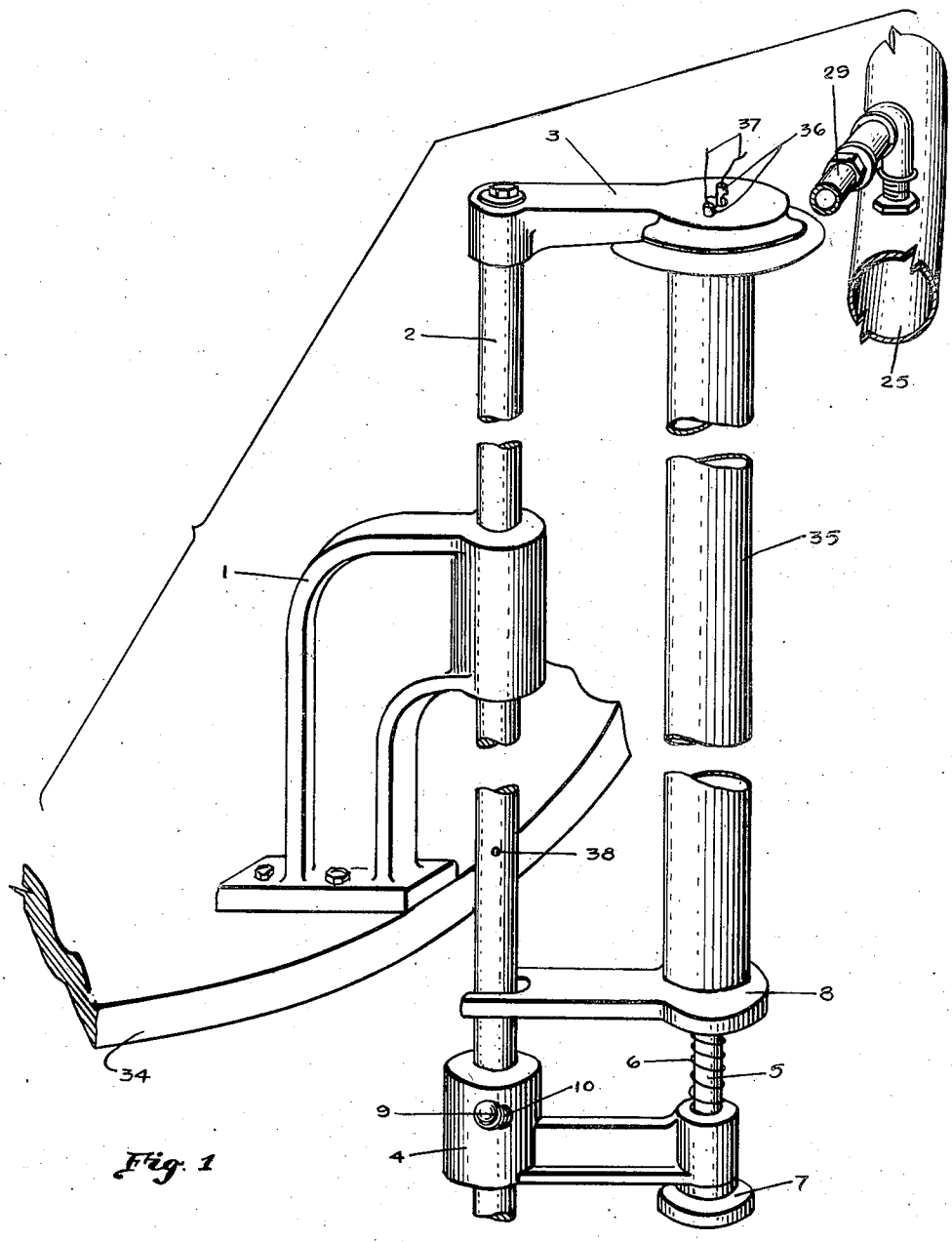


Fig. 1

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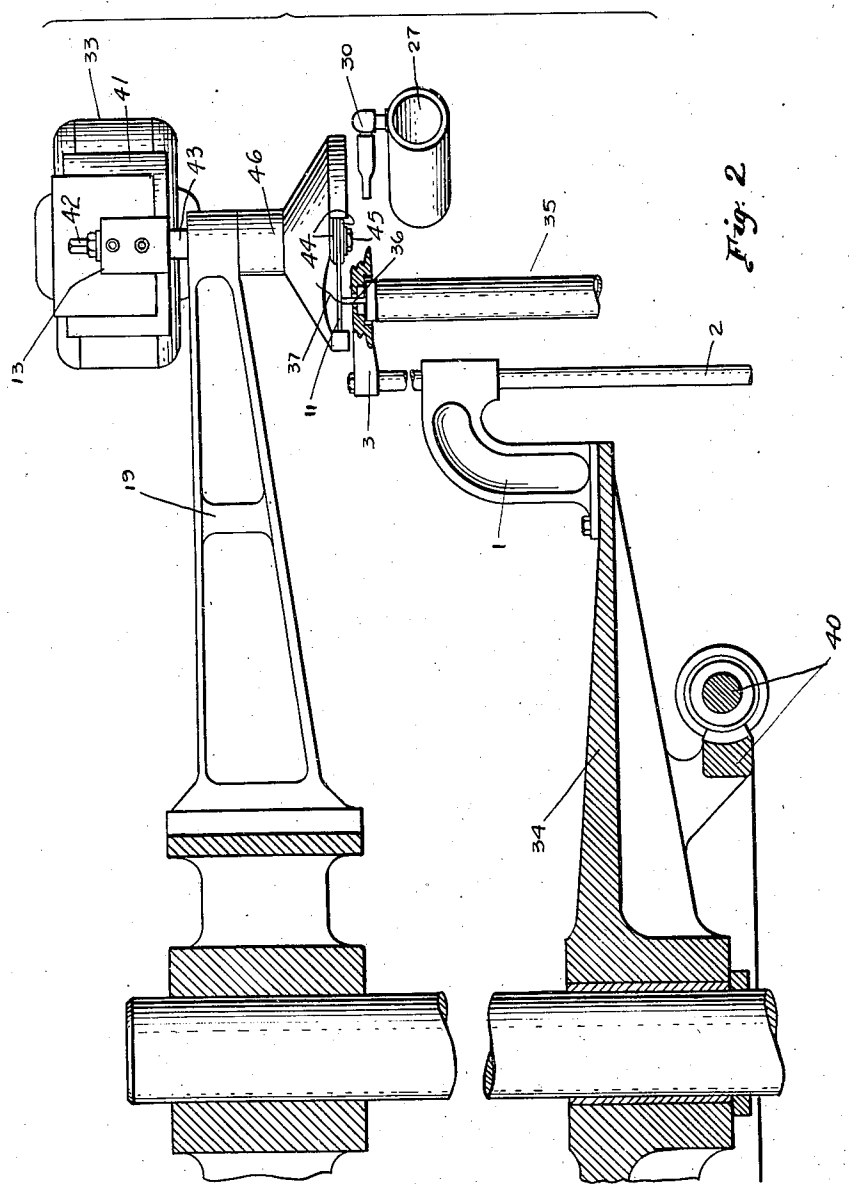


Fig. 2

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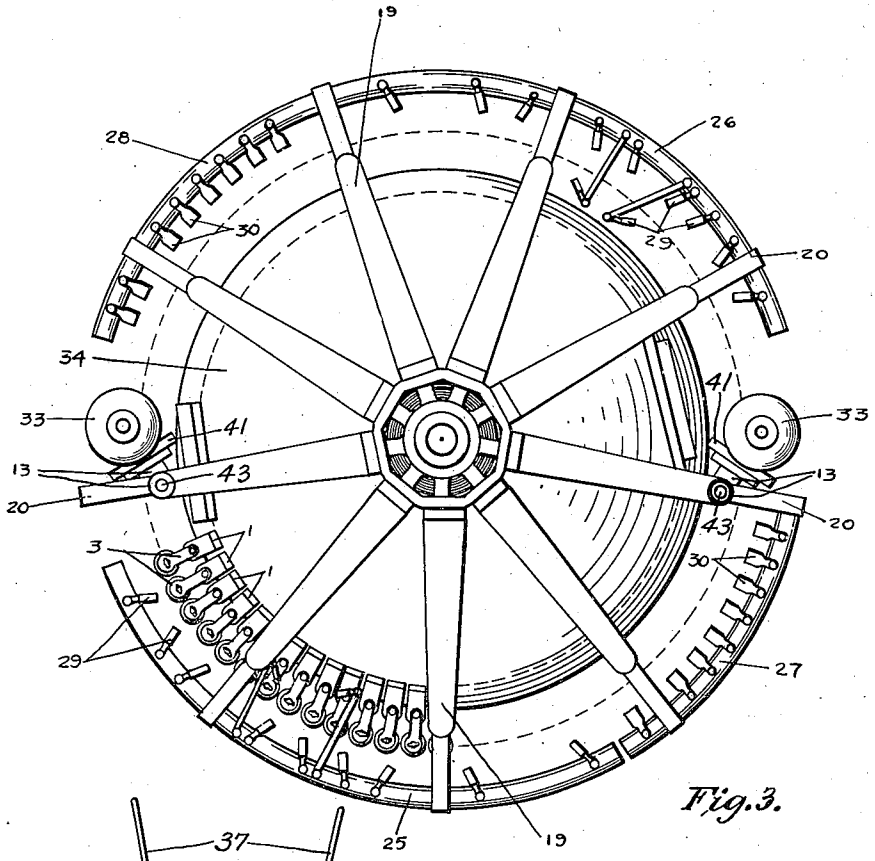


Fig. 3.

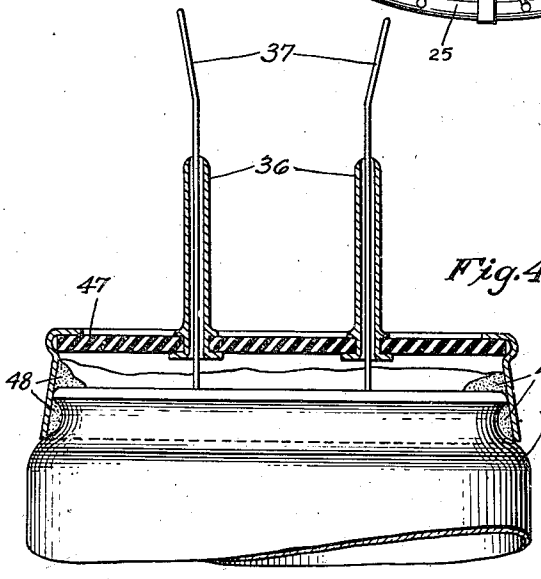


Fig. 4

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UNITED STATES PATENT OFFICE

2,264,304

LAMP BASING MACHINE

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Application September 27, 1940, Serial No. 358,672

3 Claims. (Cl. 176—3)

This invention relates to the manufacture of electric gaseous discharge lamps, and more particularly to a basing machine for fluorescent lamps.

An object of this invention is to provide a basing machine that will lock the lamp in a positive and correctly aligned position for the basing operation.

Another object is to provide a basing machine that will insure a firm, strong cementing of the base to the seal of the lamp.

A further object is to provide a basing machine that will base both ends of the lamp in one revolution of the machine.

Another object is to provide a mechanical means for cutting the lead wires and thus save the manual labor in so doing.

Further objects, advantages, and features will be apparent from the specifications below, taken in conjunction with the accompanying drawings in which:

Figure 1 is a detail of one of the head carriers showing a lamp, the basing heads, a burner, and its manifold.

Figure 2 is a side elevational view partly in section of the turret showing the worm reduction gear, a basing head carrier, the lead wire cutter supported from its spider, a cooling nozzle and its manifold.

Figure 3 is a top view of the lamp basing machine showing the manifolds, the wire cutters and their supporting spider and the turret with some of the basing heads shown in position.

Figure 4 is a detail shown partly in section of the lamp base assembly.

Similar reference characters refer to similar parts throughout the several views of the drawings.

The machine of my invention consists of a series of head carriers, 1, mounted on the machine turret 34. The head columns 2, are held in place by the head carriers 1. Attached to the top of each head column is an upper basing head 3. This upper basing head is a metal casting consisting of an arm-like extension from the head column and a cup at the end thereof for the reception therein of the base of the lamp 35. The top of this upper basing head has two elongated apertures for the protrusion therethrough of the base pins of the lamp 35. The lead-in wires 37 extend up through the base pins 36. This upper basing head 3 has several concentric rims of varying diameters forming the inner contour. This construction of the head provides for the adapting of the same machine and same heads to lamps of varying diameters.

The position of the upper basing head is a permanent one but the lower basing head 8 is adjustably mounted on the head column 2, through the lower basing head support 4, to provide for lamps of various lengths. The cup-like portion of the lower basing head 8, similar to the cup-like portion of the upper basing head 3, has several concentric rims of varying diameters forming its inner contour for the purpose of accommodating lamps of varying diameters. The casting of the lower basing head 8 is such that a forked arm forming a part thereof extends from the head proper in a manner as to enclose the head column 2 between the prongs of the fork, thus serving as a guide in keeping the lower basing head in proper alignment with the upper basing head.

The lower basing head 8 is held in position anywhere along the length of the head column 2 by the lower basing head support 4. This support 4, slides freely up and down on the head column 2 and may be locked at any desired position along the column by inserting the tapered locking pin 9 into one of several holes 38 located at various points on the head column 2 suitable to accommodate lamps of varying lengths.

The lower basing head shaft 5 through the lower basing head support 4 is attached to the lower basing head 8 and lower basing head collar 7 by set screws. The lower basing head spring 6 is wound around the shaft 5 and extends on the shaft 5 from the bottom of the lower basing head 8 to the top of the lower basing head support 4.

Thus when the operator of the machine wishes to base the lamp 35, he inserts the lower end of the lamp into the lower head and by exerting a downward pressure causes the shaft 5 to function in piston-like fashion and the spring 6 to contact. When the lower basing head has been pushed down far enough to permit the upper end of the lamp to be guided into the upper basing head and the basing pins 36 and lead-in wires 37 extend through the elongated slots provided therefor, the operator releases the downward pressure and as a result the contracted spring 6 expands and the shaft 5, around which it is wound, pushes upward causing the lower basing head 8 to move upward, thus firmly locking the lamp 35 in the heads 3 and 8. The spring 6 provides for any slight variation in the length of lamps of the same size. Thus a firm locking of the lamps in the heads 3 and 8 is always assured.

Fluorescent lamps must be based on both ends. This machine bases one end at a time. However, the machine is so constructed that both ends of the lamp will have been based when the machine has completed one full cycle. During the first half of the cycle one end is based and the lead wires cut. The operator then inverts the lamp so that during the second half of the cycle, the other end is based and the lead wires cut.

The basing operation is accomplished by directing the flame from a series of heating burners 29, projecting from the heating manifold 25, against the upper basing heads 3. As the machine turret 34, to which the head carriers 1 are attached, revolves, the upper basing heads 3 will be heated by the flame from the heating burners 29. The machine turret 34 is actuated through the worm gear asembly 40. The basing cement 47 or similar material used to bind the base to the seal of the lamp is soft when first applied to the base, but hardens when heated, thus effecting the base operation. In Figure 4, the lead wires 37 are shown in their extension from the end of the lamp 35 through the base 47 and the base pins 36. The basing cement 48 which is used to bind the base 47 to the end of the lamp is shown packed in between the rim of the seal on the end of the lamp 35 and the walls of the base 47.

Besides the heating manifold 25 there is a cooling manifold 27. A series of cooling nozzles 30 projecting from the cooling manifold 27 direct streams of cool air on to the upper basing heads 3 after the basing cement has been heated sufficiently to cause the bases to become sealed to the lamps. The reason for a cooling manifold is to aid in obtaining a firmer and more secure base and to cool off the base pins sufficiently to prepare them for soldering. If the lamp were taken off the machine immediately after the basing cement had fused the base to the lamp, the base would still be loose and therefore tend to be crooked. By cooling the base before it is taken from the machine, the basing cement sets much better and a stronger base results. Also, by cooling the base pins before soldering, a much better soldering job can be done.

Since a complete basing operation takes place twice in one revolution of the machine, there are two of these heating manifolds 25 and 26, and two cooling manifolds 27 and 28. These manifolds are held in place, suspended from the manifold support 19 by a series of manifold clamps 20.

Since it is necessary to shear the lead-in wires 37 which protrude out of the base pins 36, this operation is also performed on this machine. The cutters 11, actuated by the cutter motors 33 and suspended from the motor supports 13, are located directly over the path through which the basing heads move. The sliding bracket 41 dovetails with the motor support 13 and may be adjusted in relation to the motor support by means of the adjusting screw 42, thus raising or lowering the cutter motor in relation to the top of the base pins 36, through which the lead wires 37 project. The motor support 13 is fastened by set screws to the standard 43 which extends upward from the manifold support 19. The cutter wheel 11 is held between the washers 44 and fastened to the cutter motor shaft by the nut 45. The entire cutter blade assembly is shielded by a cone-like cutter guard 46 with notched portions for the passing of the ends of the base pins 36 and the lead wires 37 therethrough. As each top basing head with the lead-in wires extending therethrough passes the revolving cutter, the cutter shears the lead-in wires cleanly off at the tip of the base pins 36.

Just as there are two sets of heating and cooling manifolds due to the fact that a fluorescent lamp must be based on two ends, so too, there are two cutters, 11, one opposite the other on the machine, and both located directly after the cooling manifolds. Thus the lead-in wires 37 are sheared at the last step in the basing process for each end of the lamp.

When a lamp to be based is first placed on the machine, the upper end is capped by a base but the lower end of bare glass is inserted in the steel head. This direct contact of bare glass with the steel basing head is an undesirable condition especially in view of the fact that there is a certain amount of pressure being exerted to hold the lamp quite firmly in its proper position. To obviate this condition which would result in the chipping and cracking of the ends of the lamp, every other lower basing head has a moulded rubber insert. Thus those lamps that are placed on the machine for the first time will be placed on the head carrier whose lower basing head has a moulded rubber insert. Those lamps which have been based on one end will have the end which has been based inserted in the steel lower basing heads having no rubber insert since no chipping or cracking of the glass will occur once the end has been based.

What I claim is:

1. A basing machine for electric gaseous discharge lamps having base pins projecting from the base thereof and lead wires extending through said base pins comprising: a rotatable turret, a series of head carriers attached thereto, head columns attached to said head carriers, a fixed top basing head attached to the top of each of said head columns, an adjustable lower basing head attached to the lower extremity of each of said head columns, a heating manifold, a cooling manifold separate from said heating manifold and a cutter for severing said lead wires.

2. A basing machine for electric gaseous discharge lamps, having base pins projecting from the base thereof and lead wires extending through said base pins, comprising: a rotatable turret, a series of head carriers attached thereto, head columns attached to said head carriers, a fixed top basing head attached to the top of each of said head columns, an adjustable lower basing head attached to the lower extremity of each of said head columns, a heating manifold in proximity to such basing heads as hold bases to be cemented to lamps, a cooling manifold in proximity to such basing heads as have had the bases therein cemented to lamps, and a cutting blade positioned to shear such portions of the lead wires as extend out from the end of the base pins of said lamps.

3. A basing machine for electric gaseous discharge lamps, having base pins projecting from the base thereof, and lead wires extending through said base pins, comprising: a rotatable turret, a series of head carriers attached thereto, head columns attached to said head carriers, a fixed basing head attached to one end of said head columns, a spring-mounted basing head attached to the other end of said head column, a heating manifold, a cooling manifold separate from said heating manifold, and a rotating cutter blade.

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