Nov. 5, 1935. P. MEYER 2,019,622

MECHANICAL BASING MACHINE

Filed Dec. 22, 1932 4 Sheets-Sheet 1

Fig. 1.

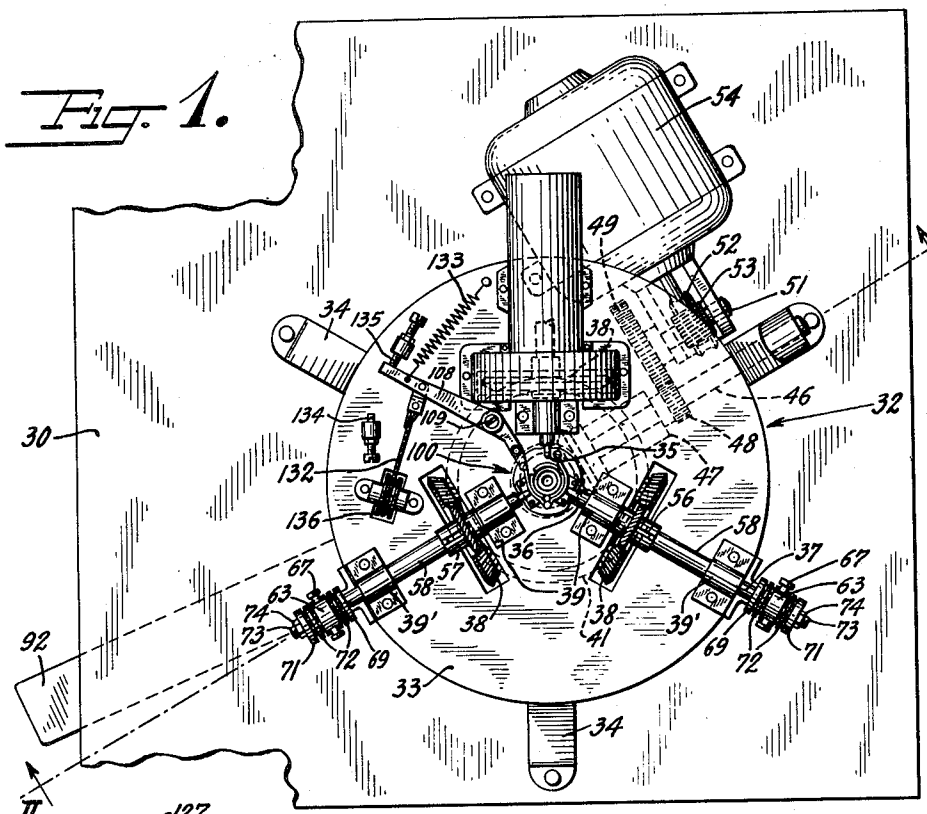
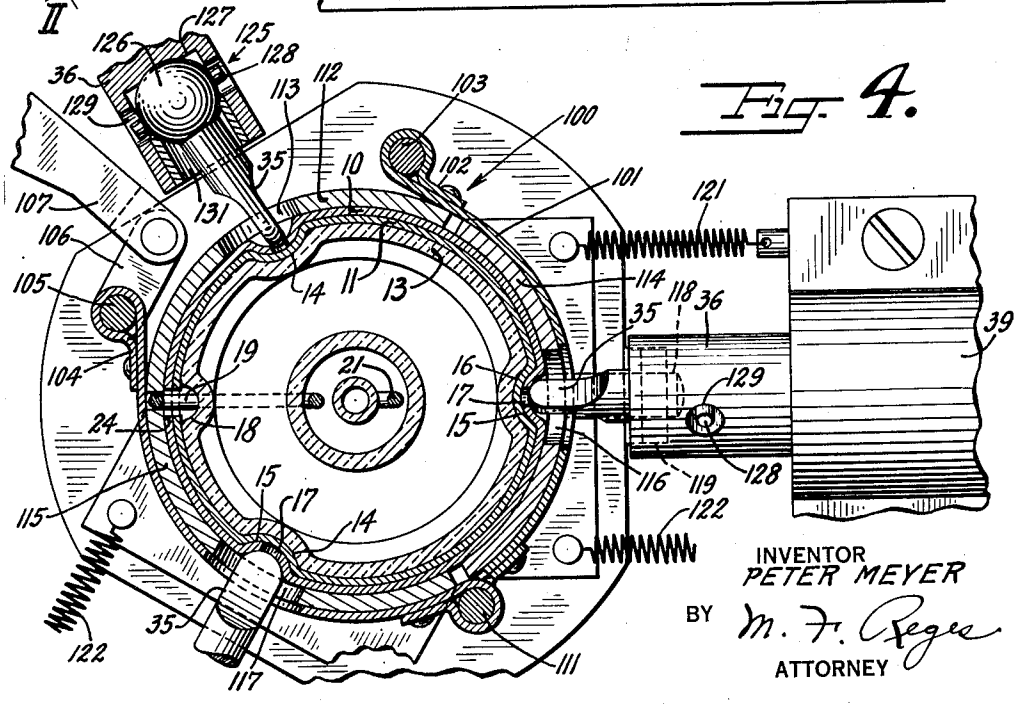


Fig. 4.



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Fig. 2.

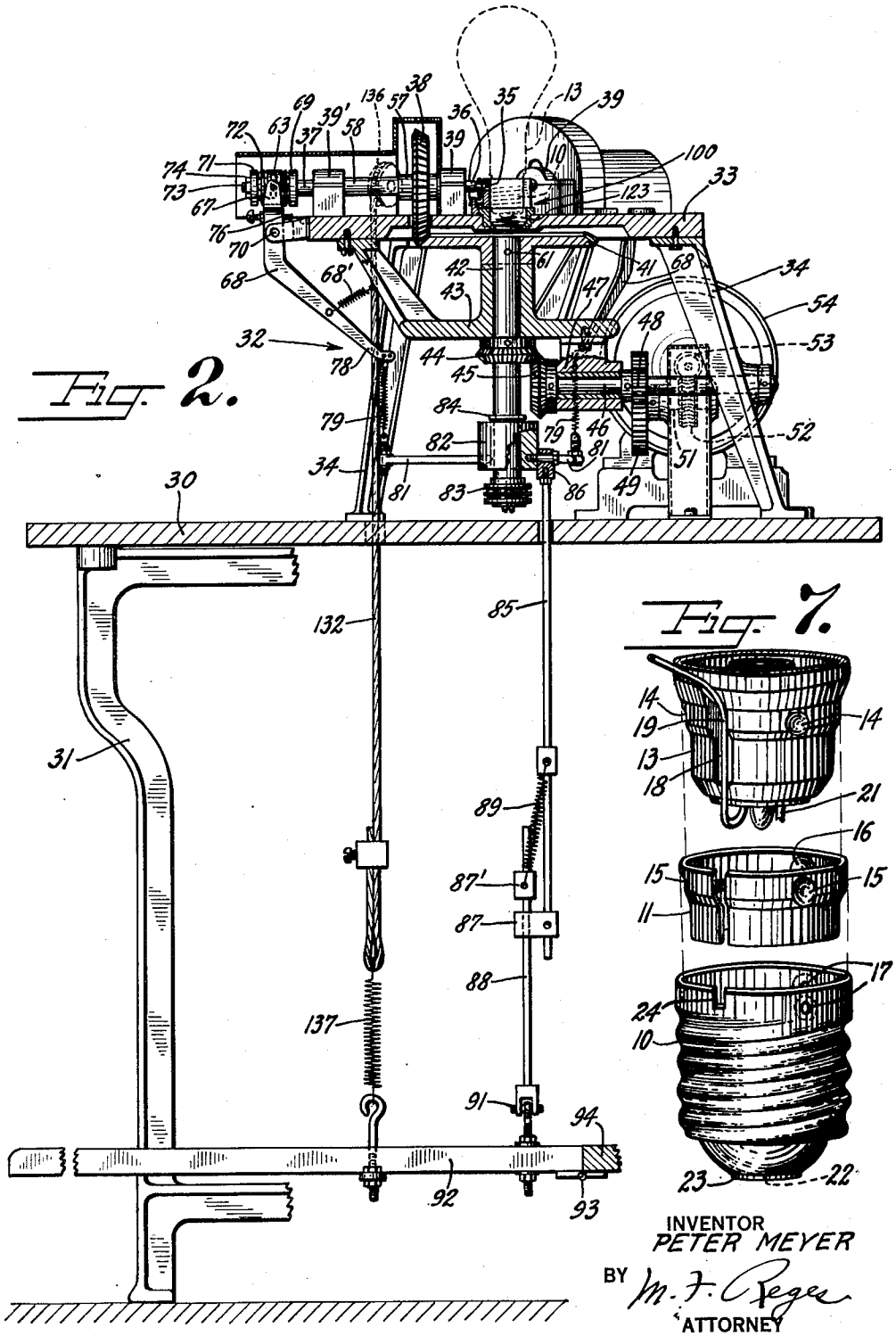


Fig. 7.

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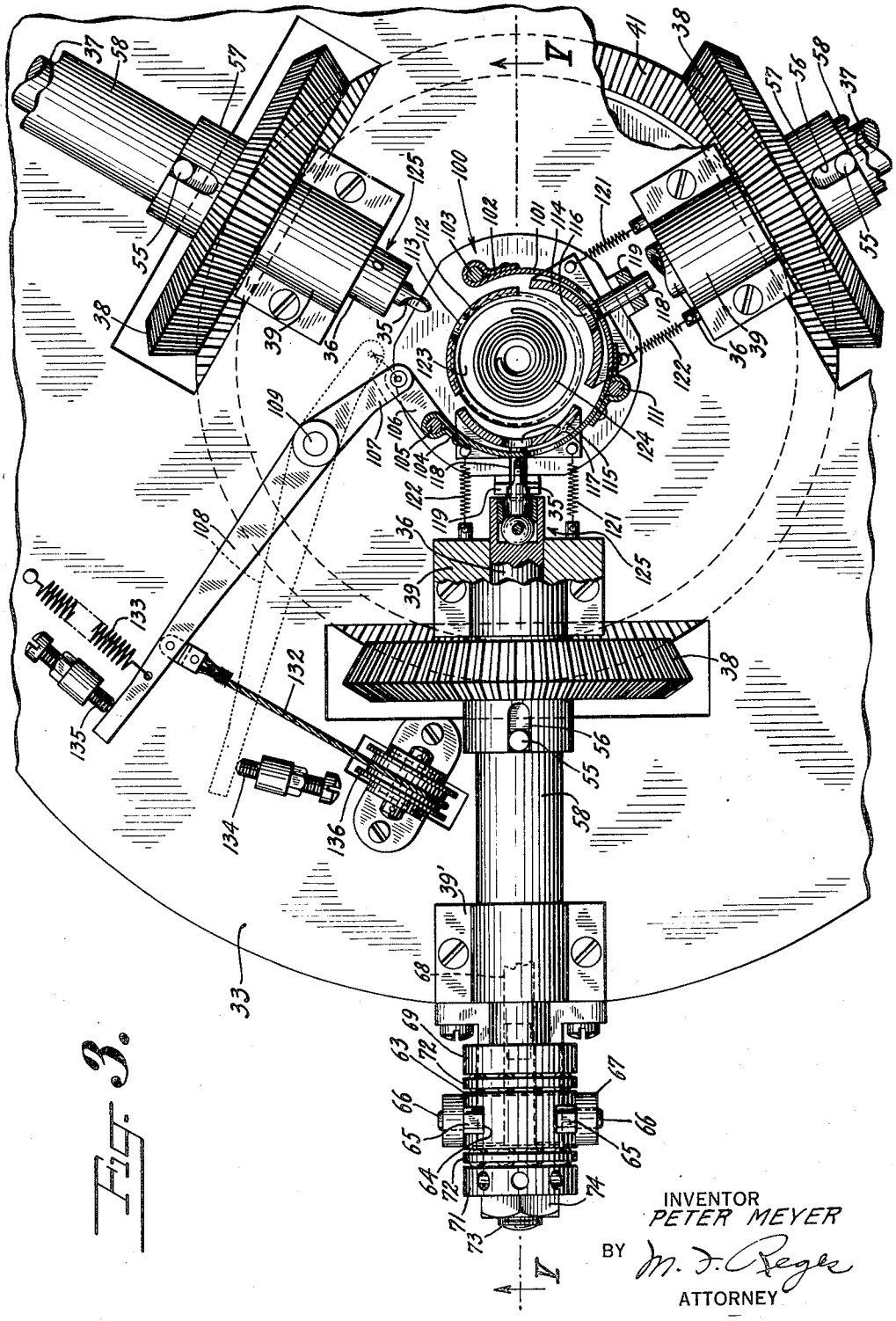


Fig. 3.

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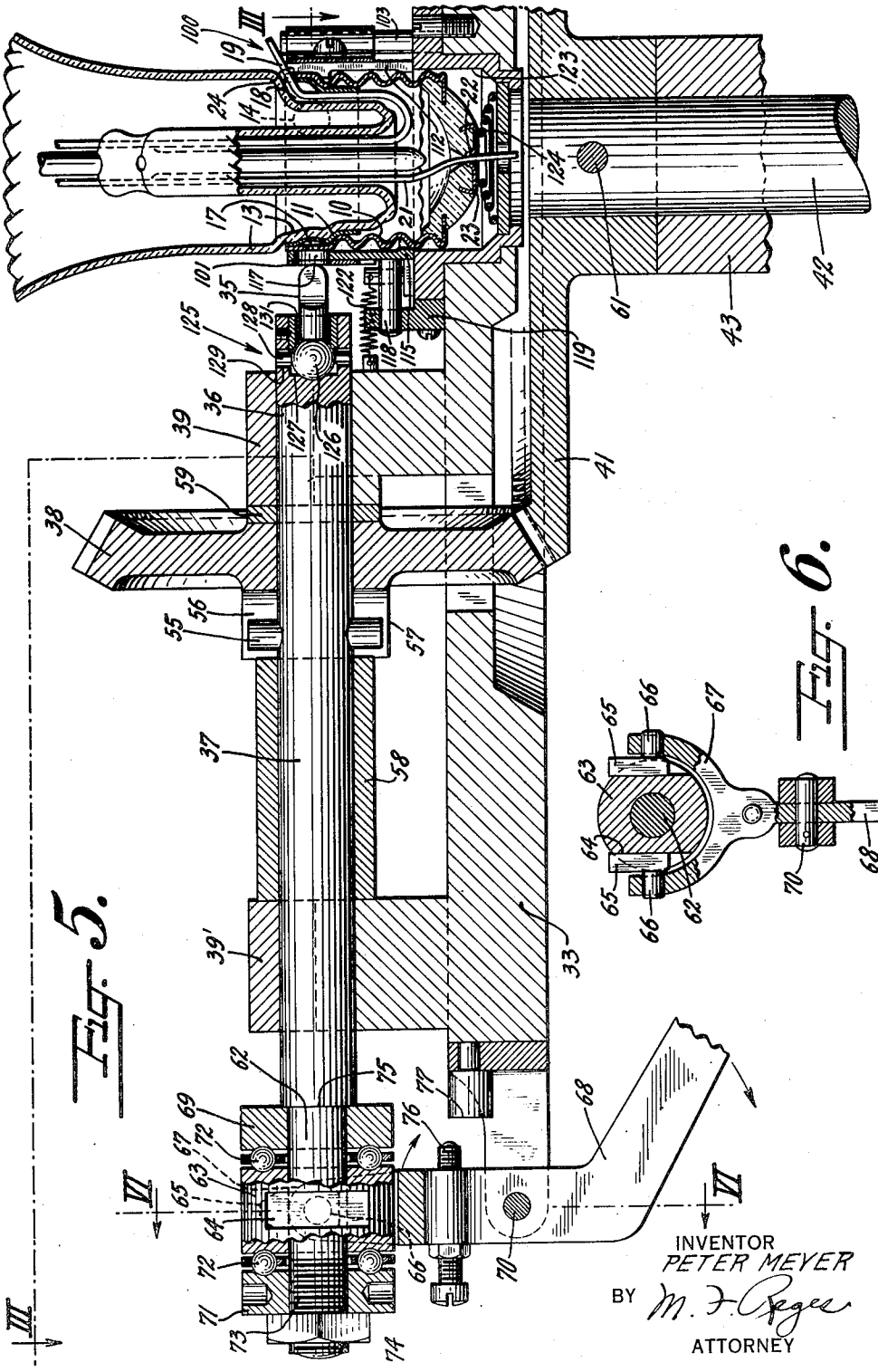


Fig. 5.

Fig. 6.

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Patented Nov. 5, 1935 2,019,622

UNITED STATES PATENT OFFICE

2,019,622

MECHANICAL BASING MACHINE

Peter Meyer, Newark, N. J., assignor to Westinghouse Lamp Company, a corporation of Pennsylvania

Application December 22, 1932, Serial No. 648,384

6 Claims. (Cl. 176—3)

This invention relates to the manufacture of electrical devices such as incandescent lamps and relates more particularly to apparatus for applying to such lamps bases of the character termed mechanical bases such as that shown and described in co-pending application Serial No. 532,394 filed April 24, 1931 and assigned to the assignee of the present invention.

As disclosed in the above mentioned co-pending application, in the manufacture of certain electrical devices such for example as incandescent lamps, it is the practice to provide the lamp with a base so arranged that it may be secured to a bulb neck by a mechanical means as distinguished from bases which are secured to the bulb by a cementitious material.

Various types of mechanical bases have been made heretofore but when making electric incandescent lamps it is essential to provide a base which is not only of relatively low cost from a production standpoint, but which may be quickly and conveniently assembled and secured to a bulb. The mechanical base structure with which the present invention is concerned includes a bulb neck having depressions or recesses around which is disposed a split band or collar having internal raised portion or protuberances arranged to be positioned in the recesses in the bulb. Around the collar is disposed a metallic threaded shell of cylindrical form and portions of the shell are spun or otherwise depressed so as to conform with depressions in the collar to engage the same and thus hold the threaded shell in place.

It is an object of the present invention to provide a simple and effective arrangement of cooperating elements for assembling and uniting the component parts of a base to mechanically secure them to a bulb.

Another object of the invention is to provide a mechanism for supporting a base and bulb in position and for automatically uniting the base to the bulb by a metal deforming or spinning operation.

Another object of the invention is to provide a mechanism for automatically moving a self-centering metal deforming tool to position in contact with a metallic surface bridging a depression.

Another object of the invention is to provide a mechanism wherein the component parts of a mechanical base are held in assembled relation with a bulb neck positioned therein for the simultaneous actuation of a plurality of spinning tools for securing the bulb to the bulb neck.

Other objects and advantages will be more fully understood from the following description together with the accompanying drawings in which:

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

Fig. 2 is a view taken on line II—II in Fig. 1;

Fig. 3 is a view taken on line III—III in Fig. 5;

Fig. 4 is an enlarged fragmentary plan view showing the various operating elements for securing a metallic base to a bulb;

Fig. 5 is an enlarged view taken on line V—V in Fig. 3;

Fig. 6 is a view taken on line VI—VI in Fig. 5 and

Fig. 7 is a perspective view of the end of a bulb neck with the two component parts of a base ready to be applied thereto.

The apparatus shown and described herein is particularly adapted for securing a mechanical base to a bulb and especially a base such as shown in the above co-pending application.

A base of this character may, as illustrated in Fig. 7, comprise a threaded metallic shell 10 and a split collar 11. This base may be applied to a prepared bulb neck 13 which neck is shaped to conform with the shape of the collar 11 and is provided with a plurality of cavities or depressions 14; usually three such cavities are provided. The collar 11 is also provided with cavities 15. Collar 11 is formed of sheet metal and the cavities 15 when pressed therefrom result in protuberances or raised portions 16 on the interior surface of the collar. The arrangement of the protuberances is such that when the collar is in position on the bulb neck these raised portions are disposed in and fit the cavities 14. When the collar is in position on the bulb neck the metallic shell 10 is positioned thereover so that apertures 17 provided in the shell are disposed over depressions 15 in the collar.

As shown in Fig. 7, the bulb neck is provided with a slot or groove 18 in which a lead wire 19 of the lamp is disposed. The other lead wire 21 passes through an aperture 22 in a metallic contact 23 and is subsequently secured to the contact by soldering. The free end of the lead wire 19 is bent outwardly and disposed in a notch 24 and soldered to the metallic shell in the usual manner.

When the collar 11 and shell 10 are positioned about the neck, the material surrounding the apertures 17 is deformed by a spinning operation so that portions of the metallic shell are forced inwardly to occupy the depressions 15 and as will

be evident, deformed material may be so worked that it will firmly press the protuberances of the collar 11 into the cavities 14 and it will also be evident that the deformed or pressed material may be made to completely fill the depressions 15 avoiding any subsequent lost motion.

It is also to be understood that, although apertures 17 are provided, if desirable, these apertures may be dispensed with and the imperforate metal spun into the depressions. It has been found, however, that by forming the apertures 17, the material finds room to expand and a more complete or intimate relation is obtained between the surfaces of the deformed material and the concave surfaces of the depressions 15. The deformation of the metallic shell 10 may be performed in any suitable manner as by applying a suitable tool.

In the manufacture of lamps in large volume it is, however, essential to provide a mechanism which will perform the base securing operation in an expeditious and uniform manner. For this purpose the present invention provides an apparatus comprising a table or platform 30 supported on legs 31. On the table is disposed a superstructure 32 comprising a plate 33 mounted on legs 34. The plate 33 is preferably in the form of a disk and is arranged to support a plurality of metal spinning tools 35.

The tools 35 are mounted on the ends 36 of rotatable spindles 37 journaled in bearings 39 and 39'. Inasmuch as the present invention provides a lamp base in which it is necessary to perform three spinning operations, the present apparatus includes three spinning tools radially disposed with respect to the plate 33, the center of the plate being provided with means for supporting the assembled parts of the base. The spinning tools and the immediate actuating mechanism therefor are of similar construction and a description of one will answer for all.

As more clearly shown in Fig. 5, spindle 37 is provided with a bevelled gear 38 which is disposed in mesh with a bevelled gear 41 mounted on a vertical shaft 42 journaled in a bearing bracket 43 beneath and carried by the plate 33. The vertical shaft 42 is provided with a bevelled gear 44 in mesh with a bevelled gear 45 disposed at one end of a horizontal shaft 46 journaled in a bearing 47 secured to the bearing bracket 43. A pinion 48 secured to the shaft 46 is disposed in mesh with the spur gear 49 mounted on a shaft 51.

Shaft 51 is provided with a worm wheel 52 in mesh with a worm 53 on the shaft of a motor 54. Motion is thus translated to the shaft 51 through the reduction gearing to rotate the mitre gears 44 and 45 thereby rotating the shaft 42 for the transmission of motion to the bevelled gear 38 for the rotation of the rotatable shaft or push rod 37 carrying the spinning tool 35. The shaft 37 is reciprocal longitudinally in the bearings 39 and 39' and is provided with a driving pin 55 disposed in a slot 56 in hub 57 of the bevelled gear 38 so that the bevelled gear 38 will drive the rod 37 and at the same time the rod may be moved endwise relative to the said bevelled gear.

A bushing 58 is provided between the bearing 39' and the hub 57 of the bevelled gear to hold the said gear in position against a loose collar 59 about the bearing 39 while the bevelled gear 41 is secured to shaft 42 by suitable pin 61.

For the purpose of imparting an endwise movement to the shaft 37, end 62 thereof is of reduced diameter provided with a block 63 having flattened sides 64 against which carriers 65 having pins 66 are disposed. The pins 66 extend through apertures in the arms of a bifrucated member 67 at one end of a lever arm 68. Block 63 is disposed between race pieces 69 and 71 for ball bearings 72. The race piece 71 is provided with a threaded aperture and held in place by a threaded end 73, rod 37, lock nut 74 being provided to hold the race pieces, and ball bearings are held as a unit against a shoulder 75 on shaft 37. The lever 68 is pivoted at 70 and an adjustable stop pin 76 is provided to engage a stop 77 to limit the movement of the arm 68 and consequently the movement of the spinning tool 35 in the direction toward the material to be deformed. A spring 68' is provided to exert a pull on the arm 68 to normally urge the shaft 37 outwardly in position to be actuated.

The lower end 78 of the lever 68 is connected by a spring 79 with an arm 81 extending from a slide collar 82 movable between an anti-friction rotatable stop 83 at the lower end of the vertical shaft 42 and an annular flange 84 on the said shaft. The slide collar 82 carries arms similar to arm 81 for actuating the remaining spinning tools. Means for actuating the collar 81 may comprise a link 85 having one end pivotally connected at 86 to the slide collar 82.

The other end of the link is provided with a guide piece 87 through which a second link 88 extends. The upper end of the link 88 is connected by a spring 89 to the link 85 at a point intermediate the guide piece 87 and the pivotal connection 86. A stop member 87' is provided to engage the guide piece 87 when the link 88 is moved downwardly in opposition to the spring 89. The lower end of the link 88 is pivotally connected at 91 to a foot treadle or lever 92 movable about the pintle hinge 93 which connects the treadle 92 with a stationary portion 94 of the machine. The foregoing description sets forth the various operating elements for actuating the spinning tools.

For the purpose of holding the several component parts of the base in position, a clamping mechanism 100 is provided. As clearly shown in Figs. 3, 4 and 5 this mechanism includes a strap 101 having one end 102 secured to a post 103 and the other end 104 secured to a pin 105 on one end of a link 106. The opposite end of the link is pivotally connected to an end 107 of a lever 108 pivoted at 109. The strap 101 is formed of two pieces pivotally connected by a pin 111. The strap 101 is in the form of an open ring and between its ends 102 and 104 is a stationary curved segment 112 having an aperture 113 for the entrance of a spinning tool.

The segment 112 is equal to a portion of the circumference around the outside of a base and movable segments 114 and 115 are provided to complete the circle to provide gripping means which will completely surround the base. The segment 114 is provided with an aperture 116 and the segment 115 is provided with apertures 117 which apertures are for the purpose of providing access for the spinning tool 35 to the base for a spinning operation.

The segments 114 and 115 are provided with guide pins 118 slidable in guide bearings 119 and springs 121 and 122 normally pull the segments outwardly and hold them in contact with the strap 101. Substantially central with respect to the segments is provided a socket or recess 123 in which a spiral spring 124 is disposed to tensionally engage the bottom of a base and when the threaded shell 10 is disposed therein the bulb

neck 13 with the collar 11 is positioned in the shell 10 and, as shown in Fig. 4, the apertures 17 are aligned with the apertures in the segments. Each depression in the collar is thus bridged by a portion of the shell 10 and the tools 35 are substantially in alignment for movement to perform a spinning operation to deform the bridging portions of the shell or depress them to bring them into intimate contact with the surfaces of the depressions in the collar.

In assembling a device of the present character it is not always possible to have extreme accuracy with respect to the assembled parts and a positive action on the part of a spinning tool might result in the misapplication of force to the end that the bulb neck might be cracked. For the purpose of making the spinning tool flexible and for preventing any irregularities from resulting in a break of the bulb neck, the tool 35 is mounted on a universal joint 125 comprising a spherical portion 126 disposed in a socket 127 and having pins 128 extending through aperture 129 through the walls of the socket.

Suitable space 131 between the shank of the tool and the wall of the socket allows for sufficient lateral movement of the tool which, by reason of its universal attachment to the shaft 37, adjusts itself to perform the spinning operation without imparting detrimental stresses to the bulb neck.

For the purpose of operating the strap to clamp the segments about a positioned base to hold it in position the lever 108 is provided with a cable 132 for moving the lever about its pivot 109 to draw the strap 101 tightly about the segments and thus securely grip a base. A spring 133 attached to the lever 108 normally holds the same in position to maintain the strap open. The movement of the lever 108 is limited between adjustable stops 134 and 135. The cable 132 is led over a guide pulley 136 and is connected to one end of a spring 137, the opposite end of which is connected to the foot treadle 92.

It will be evident that the cable 132 for operating the clamp strap and the link 88 for causing an operation of the spinning tools are both attached to the foot treadle. The link 88, however, is given a relatively small movement by reason of its position with respect to the pivot point 93, whereas the cable being of greater distance from the pivot point has a sufficient movement to operate the strap and clamp the base in position prior to the actuation of the spinning tools. Furthermore, the operation of the spinning tools is delayed since the link 88 first slides in the guide piece 87 until a stop 87' engages the guide piece thus transmitting motion to the link 85. By reason of the present construction the operation of gripping a base and the spinning operation are performed sequentially.

In operation the shell 10 and the collar 11 are disposed in position on a bulb neck. A base thus assembled is disposed in the socket 121 in position to be clamped. The apertures 17 in the shell of the base are aligned with the apertures provided in the segments of the clamping device. The foot treadle is then depressed and a pull upon the cable 132 operates the lever 108 to draw the clamping ring 101 tightly about the segments, thus firmly gripping the base and holding it for a spinning operation.

A continued movement of the foot treadle causes the stop 87 on the link 88 to engage with the guide piece 87 and the link 85 is pulled downwardly thus actuating the slide collar 82.

A movement of the slide collar 82 causes the arms 81 to transmit motion, through springs 79, to the lever arms 68 which, when rocked, cause the shafts 37 to move radially with respect to the positioned base. The shafts, which are rotated by reason of the geared connection with the motor 54, operate the spinning tools 35 which depress or spin portions of the shell 10 into intimate connections between the spinning tools 35 and the shafts 37 permit a certain amount of adjustment of the spinning tools to compensate for any irregularity in the position of the depressions 15 in the shell.

It will be noted that the operations of gripping the base and actuating the spinning tools is performed substantially sequentially by the common means in the form of the foot treadle 92. With this construction an operator may readily position a bulb and assemble the base which is gripped by the initial movement of the foot treadle and, by continuing such movement, the operation of securing the base to the bulb, by the spinning operation is completed.

The present invention makes it possible to conveniently and effectively secure a base to a bulb, and, whereas bases of the present character may be mechanically secured to a bulb by hand, the present construction provides for a more positive union between the parts and makes such operations more rapid and thereby reduces the cost of production, in line with the production costs of other lamp manufacturing operations.

Although a preferred embodiment of the invention is shown and described herein, it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A machine of the class described comprising means for holding a metallic shell with the neck portion of a bulb disposed therein, said neck portion having cavities, a plurality of metal spinning tools for pressing portions of said shell into said cavities, means for moving said tools to perform spinning operations and self-centering means for said tools.

2. A machine of the class described comprising means for holding a metallic shell with the neck portion of a bulb disposed therein, said neck portion having cavities, a plurality of metal spinning tools for pressing portions of said shell into said cavities, push rods for said tools, means for adjustably attaching said tools to said rods, means for rotating said rods and means for moving said rods to bring said tools into operative relation with portions of said shell opposite to the cavities in said bulb neck.

3. A machine of the class described comprising gripper means for holding a metallic base with a bulb neck disposed therein, said bulb neck having a recess formed therein, a rotatable push rod in substantial alignment with said recess, a metal spinning tool at one end of said rod and rotatable therewith and means for moving said rod to cause said tool to press a portion of said shell into said recess.

4. A machine of the class described comprising means for holding a metallic base with a bulb neck disposed therein, said bulb neck having a plurality of depressions formed therein, a plurality of rotatable push rods in substantial alignment with said cavities, a metal spinning tool disposed at the end of each of said rods and

rotatable therewith and means for moving said rods to bring said tools into operative relation with portions of said shell opposite to said cavities.

5. A machine of the class described comprising means for holding a metallic base with a bulb neck disposed therein, said bulb neck having a plurality of depressions formed therein, a plurality of rotatable push rods in substantial alignment with said cavities, a metal spinning tool disposed at the end of each of said rods and rotatable therewith, and means for moving said rods simultaneously to cause said tools to press portions of said shell into said cavities.

6. A machine of the class described comprising means for holding a metallic base with a bulb neck disposed therein, said bulb neck having recesses formed therein, rotatable push rods in substantial alignment with said recesses, a metal spinning tool at the end of each of said rods and resilient means for moving said rods to bring said tools into operative relation with portions of said base opposite to said recesses.

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