Sept. 29, 1953 C. E. BECHARD ET AL 2,653,417

MOUNT LOADING GUIDE

Filed Sept. 23, 1952 2 Sheets-Sheet 1

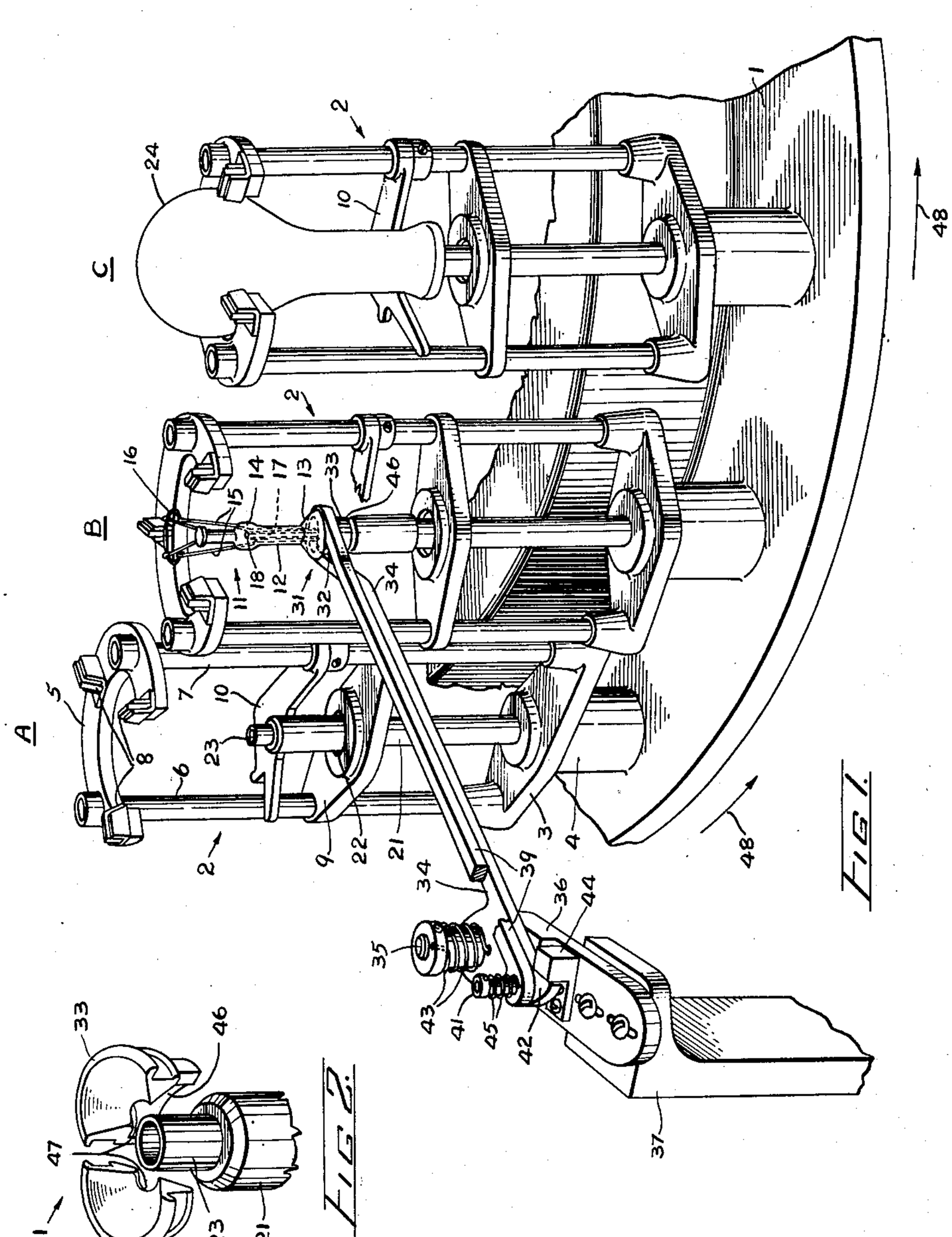

FIG. 1.

FIG. 2.

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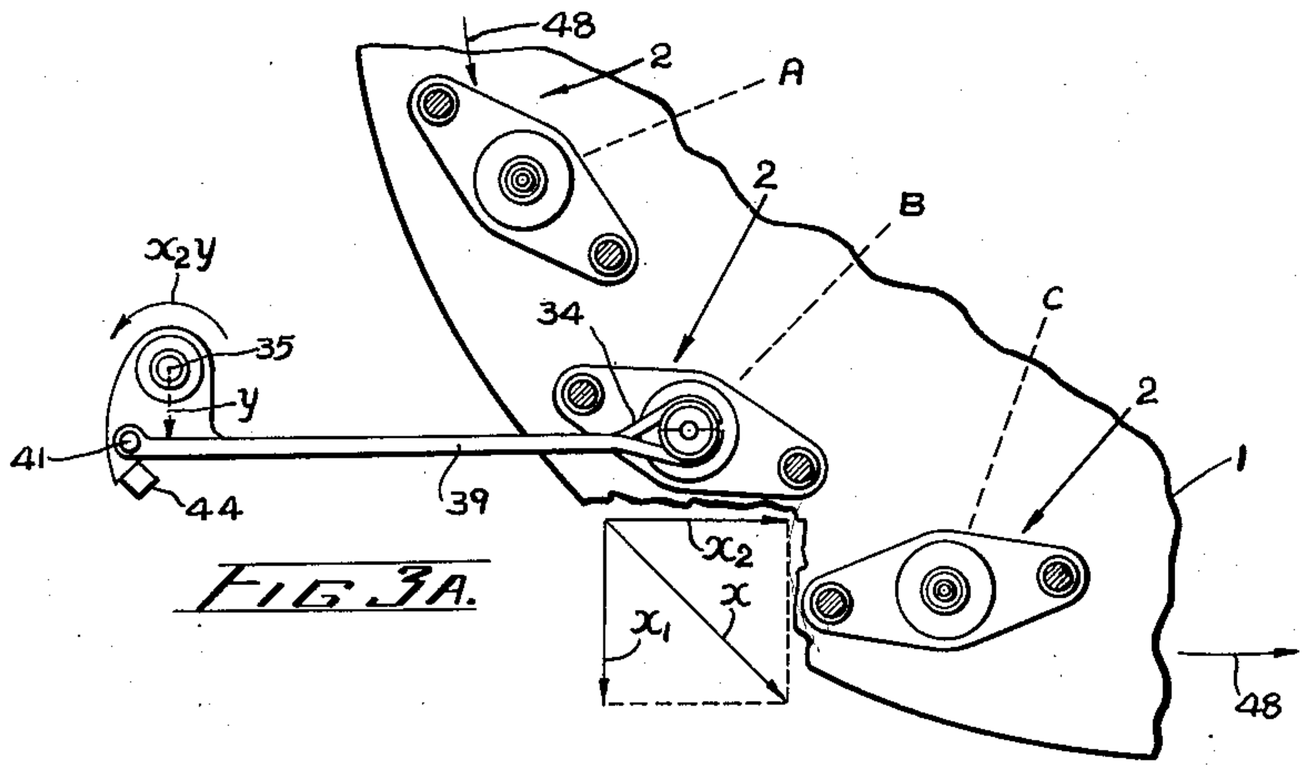

FIG 3A.

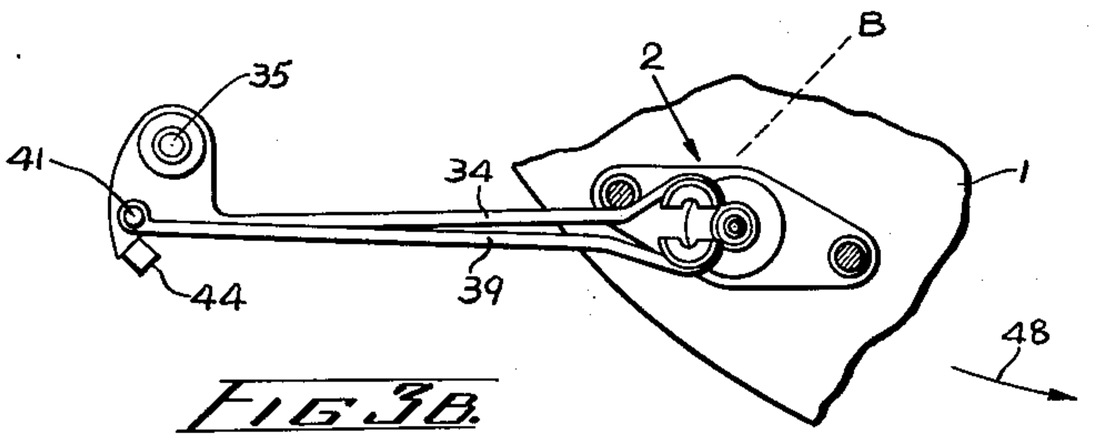

FIG 3B.

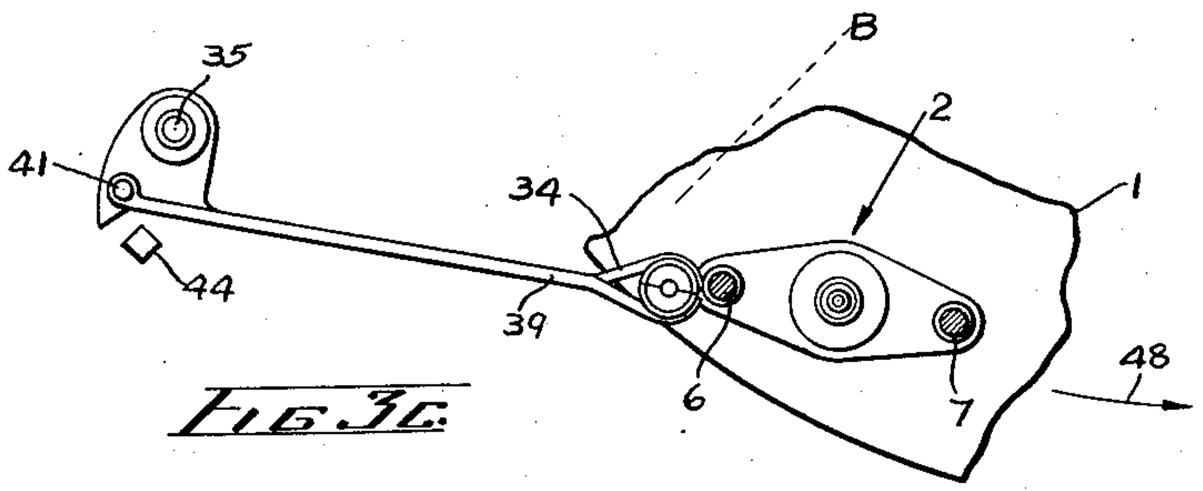

FIG 3C.

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MOUNT LOADING GUIDE

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5 Claims. (Cl. 49—2)

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This invention relates to electric lamp manufacturing equipment, and more particularly to sealing machines in which a vitreous bulb is sealed by fusing its neck to the flare of a mount.

One of the major components of an electric lamp is the mount. It generally comprises a stem tube having its upper end flattened into a press through which the filament-supporting lead wires are sealed, and its lower end formed into a flare. In addition the mount comprises an exhaust tube which depends from the upper end of the stem tube: it is used to evacuate the lamp after the mount has been sealed to the envelope. In the sealing operation, the mount and the vitreous envelope, for instance the bulb in the case of an incandescent lamp, or the elongated glass tube in the case of a fluorescent lamp, are fed to a lamp sealing machine, either manually or mechanically, wherein they are properly supported with respect to each other and passed through a series of positions in which suitable gas flames play upon them to fuse their mating surfaces together. The envelope of the lamp is a relatively large article and comparatively easily loaded into the chuck or head of the sealing machine. The mounts however are much smaller in size and the loading operation requires that the exhaust tube, along with the lead-in wires, be entered into the relatively small open end of a hollow mount spindle. This operation is quite critical; it will be appreciated that if the mount loading operation is not properly done, for instance, if one of the lead wires is left hanging outside the hollow mount spindle, it will be burned off by the sealing fires and the lamp will be worthless.

Accordingly the general object of the present invention is to provide a mechanism facilitating the feeding and accurate positioning of electric lamp mounts into hollow mount spindles in a lamp making machine.

A more specific object is to provide a new and improved mechanism for guiding the exhaust tubes and lead wires into the hollow mount spindles of a lamp sealing machine.

In accordance with the invention the above objects are effected in simple and reliable fashion by means of a spring loaded split guide or funnel which automatically positions itself over the mount spindle at each index, and which opens at the beginning of the succeeding index to allow the mount to be carried away on the spindle. In a preferred embodiment of the invention, the guide or funnel comprises a pair of coacting split segments of conical form which are supported on relatively long arms, the primary one of these

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arms being spring pivoted with respect to a fixed standard, and the secondary one being spring pivoted on the primary one. The segment of the secondary arm has a dependent skirt portion engageable by the mount pin to open a passageway between the segments to allow the mount to be carried away safely on the mount pin when the machine indexes.

For further objects and advantages and for a better understanding of the invention, attention is now directed to the following description and accompanying drawings. The features of the invention believed to be novel will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a fragmentary pictorial view of a lamp sealing machine, showing a number of lamp sealing heads and the mount loading guide of the invention operatively positioned with respect to one of the heads.

Fig. 2 is a pictorial view on an enlarged scale of the split segments of the guide, shown exploded about the mount pin.

Figs. 3*a*, *b* and *c* are simplified plan views showing in sequence the various positions occupied by the guide members during the indexing movement of a sealing head.

Referring to the drawings and more particularly to Fig. 1, the mount guide mechanism of the invention has been illustrated in conjunction with a sealing machine for incandescent lamps which may be similar to that described in U. S. Patent 1,662,045 Patterson with subsequent improvements described in U. S. Patent 2,069,086 Donovan et al. The machine comprises a turret or turntable whereof a fragment is shown at **1**, supporting a series of sealing heads **2** journalled near its periphery. A complete machine may have, for instance, sixteen heads: three have been illustrated in the drawing at successive stations A, B and C. The turret is rotated in intermittent or step-by-step fashion by means of an indexing mechanism, for instance through vertical rollers depending therefrom and a horizontal rotating drum cam, such as described for instance in Patent 2,021,001 Donovan et al. Each sealing head comprises a base **3** which is supported on a hollow shaft journalling at **4** in the turret. A bulb holding frame or yoke **5** is mounted vertically above the base **3** on a pair of side rods **6**, **7**, the bulb being supported at three points by cushioning jaws **8**. The side rods are stiffened by an intermediate frame member **9**, and a spring loaded arm **10** on side rod **7** assists in centralizing the bulb in the head.

Supported in the sealing head at station B,

there is shown a mount 11 comprising a stem tube 12 formed into a flare 13 at its lower end and into a press 14 at its upper end where the lead wires 15 pass through it to support the filament 16. An exhaust tube 17 projects downward through the center of the stem tube, the juncture being made just below the press. An exhaust port 18 is blown through at the juncture to permit subsequent evacuation of the bulb through the exhaust tube. The mount is normally supported upright on top of the central mount spindle 21 of the sealing head. The mount spindle can be raised or lowered by suitable camming means such as a track (not shown in the drawing) positioned below the turret and on which the lower end of the spindle rides. The spindle passes through a hole at 22 in member 9 and its upper end terminates in a hollow mount pin 23 into which the lead wires 15 and the exhaust tube 17 of the mount are received.

In the operation of the machine, the mounts are loaded into the spindle of the sealing head at position B, the spindle having been lowered at the preceding station A whereby a set of collet operated jaws within it are opened to permit the insertion of the exhaust tube. As the sealing head is indexed from position B to C, the spindle rises and the internal jaws grip the exhaust tube and hold the mount securely in place. At station C, a bulb 24 is loaded, either manually or preferably by automatic means into the yoke 5, in position for sealing of the bulb neck to the flare of the mount.

The mount loading guide of the present invention is designed to facilitate the loading of the mount into the mount pin of the spindle at station B. It will be appreciated that the mount loading operation is a comparatively delicate one since it is necessary to thread not only the exhaust tube, but also the lead wires into the bore of the hot mount pin. The guide device comprises a funnel 31 which is formed by a pair of frusto-conical coacting split segments 32, 33. Segment 32 is supported on a relatively long primary arm 34 which is pivoted at 35 on a bracket 36 fastened to a pedestal 37, which in turn is supported from the frame of the machine. Segment 33 is supported on a secondary arm 39 which is pivoted at 41 on a rearwardly and laterally offset portion 42 of the primary arm.

The primary arm is urged in a counter-clockwise direction by means of a relatively heavy coiled torsion spring 43, and its motion is limited by a stop 44 which is adjusted to position the guide or funnel 31 directly over the mount pin at station B. The secondary arm 39 is also urged in the same counter-clockwise direction by means of a comparatively light coiled torsion spring 45, and is limited in its motion by the mating of the two segments of the funnel. In addition the segment 33 supported by the secondary arm is provided with a depending generally semi-circular skirt portion 46, best seen in Fig. 2. When the guide is in position, skirt 46 lies close to the side of the mount pin 23. The funnel or guide 31 is thus disposed so that the central aperture 47 defined when the two segments are mated, that is, brought into apposition, is in vertical register with the aperture in the mount pin at station B of the machine.

In operation, when a head 2 is stopped at station B, the funnel 31 is located directly above the mount pin, as illustrated in Fig. 3*a*. Both arms are then pivoted counterclockwise to their fullest extent, the primary arm 34 being limited

by stop 44 and the secondary arm 39 being limited by the two halves of the funnel mating together. The mount is then loaded into the guide, the smooth inner surfaces of the funnel segments serving to direct the lead wires into the aperture of the mount pin. The machine then indexing in a counter-clockwise direction, as indicated by the curved arrows 48, a thrust is produced on the dependent skirt portion 46 of the secondary segment 33 which swings it out and away from the primary segment thereby separating the two halves and opening a passageway for the mount. This permits the mount pin and its flare riding the upper surface of the guide to pass out through the opening. Since the mount pin rises during the index interval between stations A and B, the mount experiences very little drop in riding off the top of the guide.

The arrangement whereby the secondary arm 39 is spring pivoted on the laterally offset portion 42 of the primary arm enables the secondary arm at initial opening to exert a counter-clockwise torque on the primary arm which assures that it does not swing forward until the mount is carried clear away. As illustrated in Fig. 3*a*, the force x exerted on the skirt 46 may be resolved into components x_1 and x_2, the former normal and the latter parallel to the length of the secondary arm 39. The normal component x_1 pivots the secondary arm 39 about its pivot point 41 and opens a passageway for the exhaust tube of the mount, as illustrated in Fig. 3*b*. The parallel component x_2 is translated through the secondary arm 39; however pivot point 41 is offset by a distance y from pivot point 35 where the primary arm is pivoted on the bracket. The result is a momentary counter-clockwise torque x_2y on the primary arm 34 which, added to the torque exerted by its coil spring 43, holds it tightly, for the time being, against its stop 44. Thus any possibility of the primary arm closing in and snapping off the exhaust tube of the mount, due for instance to vibration or the friction drag of the secondary arm at the beginning of the index cycle, is eliminated.

As the head continues to index, the mount now having passed beyond the guide segments, the trailing side rod 6 of the sealing head strikes the primary arm 34 and both arms pivot together in a clockwise direction until the side rod has passed clear beyond them, as illustrated in Fig. 3*c*. The arms then pivot back together and reposition themselves over the mount pin of the succeeding head on the turret now entering station B.

In actual operation, it has been found that the mount loading guide of the present invention materially facilitates the loading of mounts into the mount pin, and, where manual loading is employed, a marked improvement in the shrinkage factor has been observed. The operators loading the machine lose the fear of attempting to enter the exhaust tube and lead wires into an extremely hot and small mount pin and now accomplish the task with considerably greater ease. Moreover the guide eliminates the hazard of the operator touching the hot mount pin, the guide itself remaining relatively cool.

It will be appreciated that in the case of a sealing machine where the mount spindle does not rise between positions B and C as described, it may be desirable to provide some means such as a sloping guide between those two positions to engage the under side of the flare of the mount and prevent it from dropping suddenly onto the

head of the mount pin as it leaves the edge of the funnel.

While a certain specific embodiment of the invention has been shown and described, it is to be considered as an illustrative example. The apparatus is obviously adaptable to other types of sealing machines where the same problem exists, including fluorescent lamp sealing machines wherein a generally similar type of mount is sealed to an elongated glass tube. The appended claims are therefore intended to cover any such modifications coming within the true spirit and scope of the invention.

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

1. A guide device for loading the exhaust tube of an electric lamp mount into the hollow mount pin of a head of a lamp sealing machine comprising a pair of segments coacting to define a funnel, a primary spring loaded arm supporting one of said segments, a stop determining the normal position of said primary arm, a secondary arm generally parallel to said primary arm supporting the other segment and spring pivoted with respect to said primary arm, and means on said secondary arm engageable by a cooperating portion of said head for actuating said secondary arm while maintaining the primary arm against its stop.

2. A guide device for loading the exhaust tube of an electric lamp mount into the hollow mount pin of a head of a lamp sealing machine comprising a pair of segments coacting to define a funnel, a primary arm supporting one of said segments, spring means urging said arm in one direction, a stop determining the normal position of said primary arm, a secondary arm generally parallel to said primary arm supporting the other segment and hinged upon an offset portion of said primary arm, spring means urging said secondary arm in the same direction as said primary arm, and means on said secondary arm engageable by a cooperating portion of said head for actuating said secondary arm while maintaining the primary arm against its stop.

3. A guide device for loading the exhaust tube and lead wires of an electric lamp mount into a hollow mount pin of a lamp sealing machine comprising a pair of segments coacting when mated to define a funnel having an aperture, a pair of generally parallel arms supporting said segments, the primary one of said arms being spring pivoted and having stop means normally locating it with the aperture of the funnel in registry with the mount pin at a station of the sealing machine, the secondary one of said arms being hinged on an offset portion of said primary arm and spring pivoted with respect thereto by a relatively light spring urging it to mate its segment with that of the primary arm, and a dependent skirt portion on the segment of said

secondary arm adapted to engage the edge of the mount pin whereby to exert a thrust on said secondary arm producing components of force, one causing said secondary arm to swing open and the other exerting a torque on said primary arm holding it in place whereby to prevent inopportune swinging of said primary arm.

4. In combination with a lamp sealing machine of the type comprising a plurality of lamp holding heads arranged for indexed motion along a given path, each of said heads including a hollow mount pin, a guide device for loading the exhaust tube and lead wires of a mount into the mount pin, comprising a pair of segments coacting when mated to define a funnel, a primary arm supporting one of the segments, spring means urging said arm against the direction of motion of the heads, a stop determining the normal position of said arm locating said funnel over the mount pin at a station of the sealing machine, a secondary arm generally parallel to said primary arm supporting the other segment and hinged upon an offset portion of said primary arm, spring means urging said secondary arm in the same direction as said primary arm to mate the segments, and means on said secondary arm engageable by a cooperating portion of the head for actuating the secondary arm while maintaining the primary arm against its stop.

5. In combination with a lamp sealing machine of the type comprising a plurality of lamp holding heads arranged for indexed motion along a given path, each of said heads including a hollow mount pin, a guide device for loading the exhaust tube and lead wires of a mount into the mount pin, comprising a pair of segments coacting when mated to define a funnel having an aperture, a primary arm supporting one of the segments, spring means urging said arm against the direction of motion of said heads, a stop determining the normal position of said primary arm locating said aperture in registry with the mount pin at a station of the sealing machine, a secondary arm generally parallel to said primary arm supporting the other segment and hinged upon an offset portion of said primary arm, relatively light spring means urging said secondary arm in the same direction as said primary arm to mate the segments, and a dependent skirt portion on the segment of said secondary arm engageable by the mount pin at the beginning of the index motion for swinging said secondary arm out while maintaining the primary arm against its stop, whereby to clear a passageway for the mount.

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No references cited.