Dec. 6, 1955 G. D. BRENT ET AL 2,725,919

TUBULAR LAMP BASE CHUCKS FOR BASING MACHINE

Filed Oct. 16, 1951

2 Sheets-Sheet 1

Fig. 1.

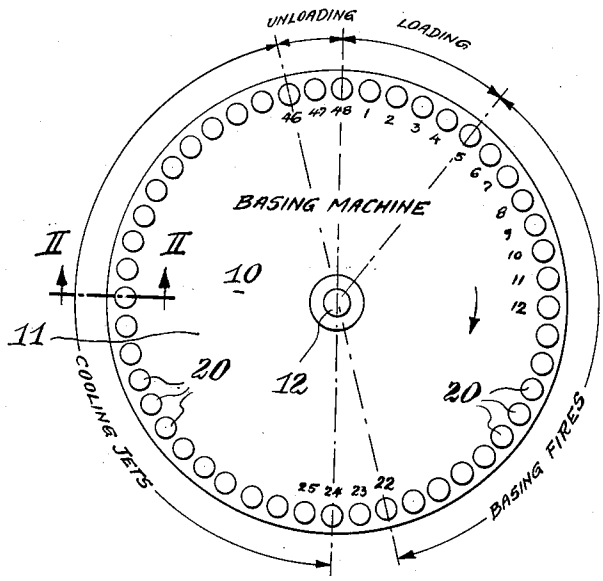


Fig. 2.

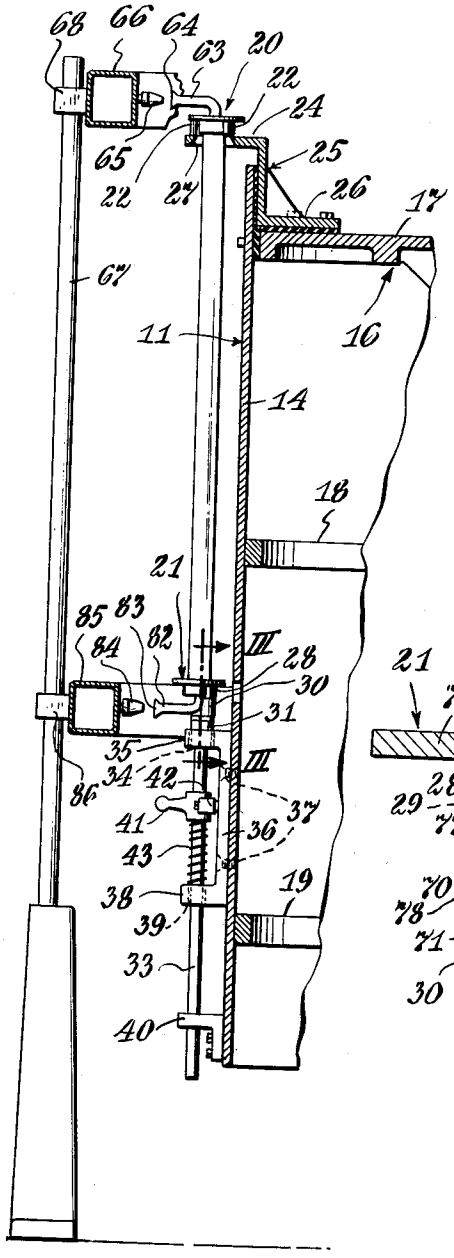
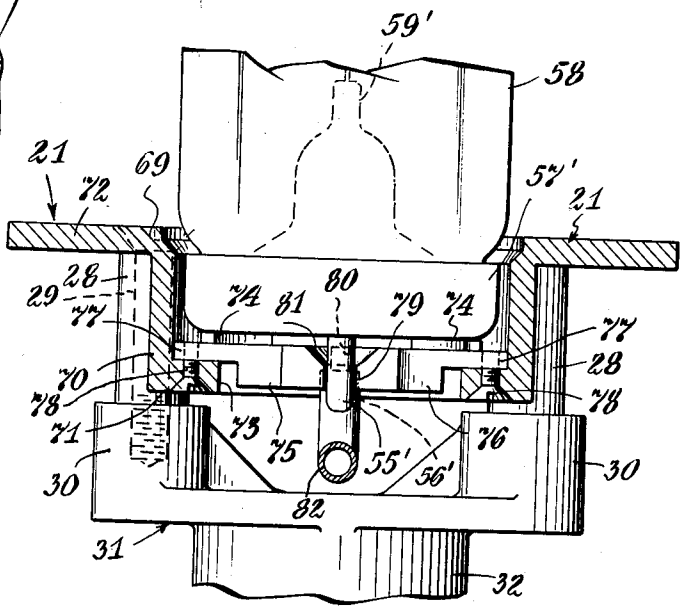


Fig. 3.



INVENTORS
G. F. BRENT
J. M. CAMPBELL
D. S. GUSTIN
BY
ATTORNEY

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Fig. 4.

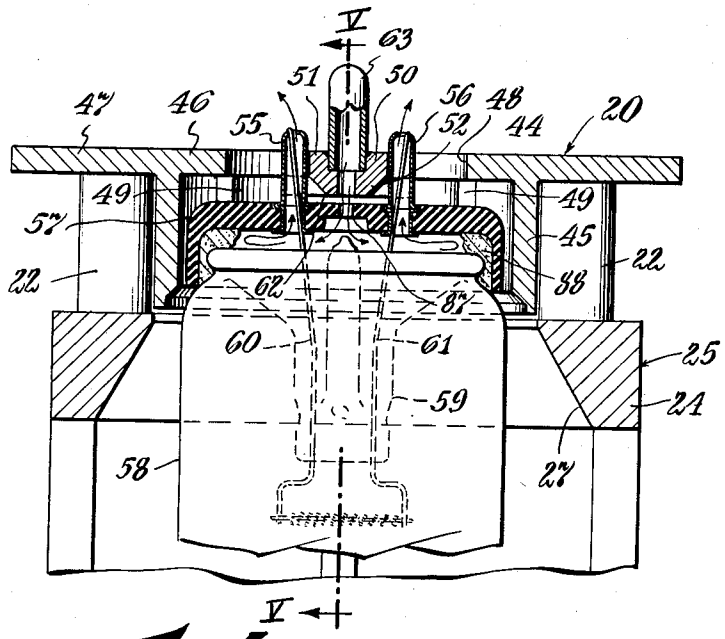
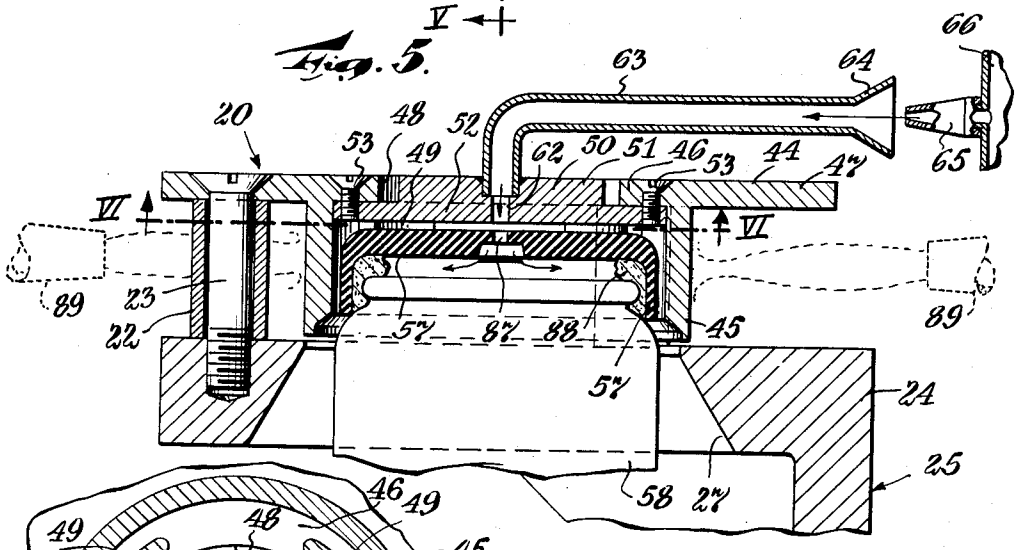


Fig. 5.



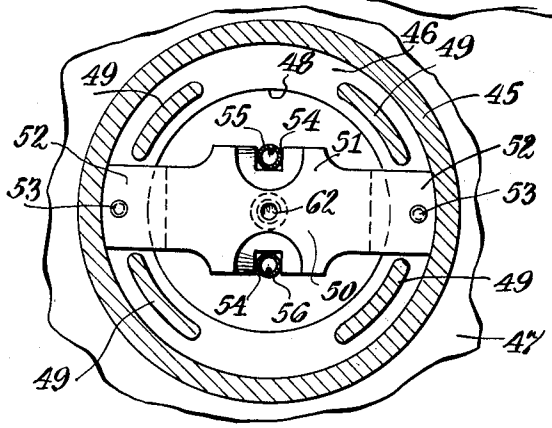


Fig. 6.

INVENTORS
G. F. BRENT,
J. M. CAMPBELL,
D. S. GUSTIN.
BY
ATTORNEY

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TUBULAR LAMP BASE CHUCKS FOR BASING MACHINE

George D. Brent, John M. Campbell, and Daniel S. Gustin, Fairmont, W. Va., assignors to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania

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4 Claims. (Cl. 154—1.6)

This invention relates to basing machines and, more particularly, to tubular lamp base chucks for a basing machine.

In the present method of basing tubular lamps, such as fluorescent lamps and the like, an upper and a lower basing chuck, usually bronze, are employed to correctly position the cement pre-filled bases with respect to the lamp envelope and align the pins of each base with respect to each other. The chucks also hold the lamp and the bases in a vertical position in a conventional machine as it rotates the lamp in the basing oven. The present chuck, of generally hollow T-shaped configuration, has base pin locating holes in the bottom thereof. The continuous insertion into, and the removal of the base pins from, these holes wears off the corners and elongates the holes, thereby causing misalignment of the bases relative to the lamp envelope. After 8 to 10 months of daily use, the worn chucks must be replaced and re-conditioned. This in itself is a time consuming and expensive task.

Further, the bottom of the plastic base rests on the bottom of the base chuck which after several cycles of, for example, a 48 head machine, becomes extremely hot and the base blisters.

Alcohol in the basing cement vaporizes therefrom on the application of the necessary basing heat from the oven. This vapor collects in the area around the base and, if allowed to mix with the atmosphere, forms an explosive mixture and tends to maintain the cement in a plastic state. Further, at the end of the basing cycle, when the lead wires are cut by the wire cutting file and the lamp is removed from the chucks while the cement is hot and plastic, the cement bond between the base and the lamp is broken and the loose bases may result. Movement of the loose bases causes loss of the desired base pin alignment relative to each other, and in addition, crooked bases.

Hence, it has been found advantageous, according to our invention, to provide a tubular lamp base chuck with a hardened insert or bottom pin guide plate which reduces maintenance and over a long period of time improves base pin alignment during the basing operation. This chuck is provided with an air blast through a hole in the bottom pin guide plate for cooling, near the end of the basing cycle, the base, baked cement and a lamp stem and for removing the potentially explosive evolved alcohol vapor which also retards the setting of the cement, thereby eliminating loose and blistered bases. Our chuck comprises a hollow cup-like housing having a peripheral flange, supporting ribs on and an axial hole in its bottom surface and a pin guide plate with base pin locating slots and an air blast hole therein, diametrically secured across the cavity. Further, the prior art style chucks may be economically reconditioned by machining the bottoms into the desired configuration with supporting ribs thereon, and by affixing the pin guide plate thereto as mentioned above.

In its general aspect the present invention has the object of overcoming the afore-mentioned disadvantages of the prior art tubular lamp basing machine chucks.

Specifically, an object of the present invention is to reduce maintenance over a long period of time on the basing chuck and to improve base pin alignment during the basing operation.

Another specific object is to provide a tubular lamp base chuck with air cooling, near the end of the basing cycle, to cool the base, baked cement and the lamp stem, and to remove any evolved alcohol vapor from the basing area, thereby eliminating loose and blistered bases.

A further object of the invention is a tubular lamp base chuck having a hollow flanged housing with supporting ribs on its bottom surface and a hardened pin guide plate with base pin locating slots and an air blast hole therein, diametrically secured across the cavity.

An additional object is a hardened pin guide plate for a tubular lamp base chuck adaptable for use in reconditioning worn base chucks of the prior art configuration.

Other objects and advantages of the invention will appear to those skilled in the art to which it appertains as the description proceeds, both by direct recitation thereof, and by implication from the context.

Referring to the accompanying drawings, in which like numerals of reference indicate similar parts throughout the several views:

Fig. 1 is a horizontal plan view of a 48-head basing machine embodying our invention;

Fig. 2 is an enlarged radial sectional view at a station of the machine of Fig. 1, on line II—II of Fig. 1, in the direction of the arrows;

Fig. 3 is an enlarged fragmentary elevational view of a lower air-cooled spring-supported basing machine chuck of our invention, with parts in section on line III—III of Fig. 2, in the direction of the arrows;

Fig. 4 is an enlarged fragmentary elevational view of an upper-air-cooled basing machine chuck of our invention;

Fig. 5 is an axial sectional view of the chuck on the line V—V of Fig. 4, in the direction of the arrows; and

Fig. 6 is a horizontal sectional view of the chuck on the line VI—VI of Fig. 5, in the direction of the arrows.

Referring to the drawing in detail, and first considering Fig. 1, a basing machine embodying our invention is shown and designated by the reference numeral **10**. This machine comprises a carrier or reel **11** and means for rotating the carrier about a stationary shaft or standard **12**. This carrier rotating means (not shown) may consist of a conventional indexing mechanism driven by a sprocket chain from a suitable motor shown and described in U. S. Patent No. 2,439,884, entitled "Method and Machine for Basing and Seasoning Fluorescent Lamps," issued to J. M. Campbell and assigned to the same assignee as the subject application.

Carrier, and chuck mounted thereon

This carrier **11** (Fig. 2) consists of an outer cylindrical casing **14** mounted, as by suitable bolts or welds, on an upper portion **17**, a middle portion **18**, and a lower portion **19** of a reel casting **16**. Said carrier is provided with a series of upper air-cooled chucks or heads **20** and lower spring-supported air-cooled chucks **21**. Although any desired number of chucks may be employed on machine **10**, in the present showing 48 of said chucks are shown. Each of the upper chucks **22** is, in the embodiment of Fig. 2 and Fig. 5, supported by three hollow cylindrical spacers **22**, and affixed by screws **23** within said spacers **22** to an upper flange **24** of a **Z** iron support **25** having its lower flange **26** bolted to the upper portion **17** of casting **16**. The support **25** extends around the periphery of carrier **11** and is suitably electrically insulated from casing **14** and upper portion **17** of reel **11**.

A series of flared apertures 27 (48 in this embodiment) are provided in upper flange 24 of support 25 which register with a complementary opening in each of the upper chucks 20, as hereinafter described.

Each of the spring-loaded or supported lower chucks 21, as shown particularly in Figs. 2 and 3, is supported on two hollow cylindrical spacers 28, similar to spacers 22, and affixed by means of two screws 29 (Fig. 3), similar to screws 23, within said spacers 28. The screws 29 thread into an open-ended cylindrical body 30 of a support casting 31, having an axial hub 32 depending below said body 30. This hub 32 is pinned to a shaft or rod 33 (Fig. 2) and is slidable in a suitable bearing 34 provided in an upper flange 35 (Fig. 2) of a U-shaped bracket or casting 36. Screws 37 are employed to affix casting 36 along its vertical side to the casting 16 of carrier 11. The rod 33 is further slidable in a bearing 39 in a lower flange 38 of casting 36 and extends through an L-shaped bracket 40, located near the bottom on casing 14. On rod 33 between upper flange 35 and lower flange 38 of casting 36, an adjustable hand lever or handle 41 is secured as by pinning. This handle 41 has a keying projection 42 (Fig. 2) which slides in a vertical slot (not shown) in a vertical portion of casting 36, thereby preventing the rotation of handle 41 and the body 30 of support casting 31 during its reciprocating vertical travel. Between handle 41 and lower flange 38 of casting 36 and on rod 33 a spring 43 is provided for spring-supporting said lower chuck 21.

Upper chucks

Each of the upper chucks 20 comprises, as shown in Figs. 4, 5 and 6, a hollow inverted cup-like chuck body or housing 44, suitably brass, having a vertical cylindrical side wall 45 and a washer like (Fig. 6) horizontal top or cover portion 46. Said chuck body is provided with a top peripheral flange 47 extending beyond the side wall 45 in the plane of the top portion 46. As shown particularly in Fig. 6, a circular hole 48 and four quadrental supporting ribs 49, circularly arranged in spaced relationship, are machined out of the inside surface of top portion 46. A pin guide plate 50, suitably case hardened cold rolled steel, of generally rectangular horizontal section, consists of a plate body 51 and lower flanges 52 (Fig. 5) on the lower portion of said body. These flanges 52 of plate 50 are diametrically affixed (by screws 53) between adjacent ribs 49, as shown particularly in Fig. 6, to the cover portion 46 of the chuck body 44. It will be understood that the supporting ribs 49 depend further from said top portion 46 than the flanges 52 of plate 50, thus providing air cooling space and preventing blistering of an upper base 57, as hereinafter explained.

Base pin locating slots 54 (Fig. 6) are provided in each plate body 51 for aligning the base pins 55 and 56 (Fig. 4) of a base 57 with respect to a lamp 58 having a mount 59 with leading-in conductors 60 and 61. The bottom surface of slots 54 and plate body 51 are beveled upwardly approximately 45° to facilitate insertion of base pins 55 and 56 into slots 54. A center air blast hole 62 is provided through each plate body 51 for connection with a cooling air stream riser 63, secured to each plate body 51, as by brazing.

These risers 63, as shown in Fig. 5, curve to point radially outward from the center of machine 10 and are provided with flared ends 64 terminating suitably slightly beyond the outside surface of upper flange 24 of the Z iron support 25. When indexed, there are registered with said flared ends 64, cooling air nozzles 65 from an upper manifold 66. This manifold is affixed by means of brackets 68 to a series of pillars or vertical supports 67 (Fig. 2), arranged in spaced circular sequence about a portion of the periphery of machine 10. Sufficient clearance is provided between nozzles 65 and the flared ends 64 to permit the indexing rotation of carrier 11.

Lower chucks

Each of the lower spring supported chucks 21, as shown in Figs. 2 and 3, is similar in construction to upper chucks 20 and has a cup-like body 69 with a cylindrical side wall 70 and a washer-like bottom portion 71. Each lower chuck body 69 is provided with a top peripheral flange 72 extending beyond side wall 70. A segment of each flange 72 adjacent carrier casing 14 is suitably cut off (Fig. 2) to prevent contact between said flanges and said casing. An axial hole 73 and supporting ribs 74 are formed in each bottom portion 71. A pin guide plate 75, similar to plate 50, having a plate body 76 and a top flange 77 is secured by screws 78 to the top surface of each bottom portion 71. As in the case of top chucks 20, guide pin slots 79 and a center air stream hole 80 are provided through each plate body 76.

In this case the upper portions 81 of each slot 79 are counterbored to facilitate insertion and removal of base pins 55' and 56' of a lower base 57' (Fig. 3) in and from slots 79. An air stream riser 82 secured in the bottom of plate body 76 connects with each hole 80 and depends from said body. Said risers curve to point radially outward from the machine, and as shown in Fig. 2, are provided with flared ends 83 which register with nozzles 84 of a lower air stream manifold 85. By means of brackets 86, lower manifold 85 is affixed to the pillars 67 and supported thereby.

Carrier operation

The carrier 11 of the basing machine 10, shown in Fig. 1, rotates clockwise. The lamps 58 and cement-filled upper bases 57 and lower base 57' are loaded into the machine 10 in stations 1 to 4, as hereinafter explained. In stations 5 through 22 means for directing gas fires on upper chucks 20 and lower chucks 21, such as stationary nozzles 89, shown in Fig. 5, heat the upper base 57 and the lower base 57' of each lamp 58 in gradually increasing temperature steps, thereby causing the cement to become semi-plastic and fill every crack and crevice between the individual base and the lamp 58. At station 23 the lamp cools somewhat to prevent bulb cracks due to the immediate application of an air blast. From station 24 through station 46 means for directing a cooling air stream into said upper and lower chucks is provided. As in the case of each upper chuck, air blasts from nozzle of upper manifold 66 blow through risers 63, holes 62 in pin guide plates 50 and holes 87 in the bases 57, through the cavity between bases 57 and the ends of lamps 58, and out the base pins 55 and 56. This action of the air stream simultaneously removes any alcohol vapor evolved from the basing cement during the heating operation and also cools and sets the cement to prevent loose bases when the lead wires of the lamps are cut by the wire cutting file in stations 45 and 46 and the bases are removed from the chucks in the lamp unloading stations 47 and 48.

Operation of the chucks

According to our invention, the leading-in conductors 60 and 61 of mount 59 at each end of the lamp 58 are straightened and inserted into their respective pins 55 and 56 of an upper base 57, suitably pre-filled with a basing cement 88. Lower chuck 21 is lowered by handle 41 on rod 33 and with the base pins 55 and 56 still properly aligned with respect to the mount 59 said pins are inserted through beveled apertures 27 of Z iron support 25 and chuck body 44 in registry with aperture 27 into center slots 54 of pin guide plate 50 of an upper chuck 20. With the lower chuck lowered sufficiently to permit passage of the lower base 57', the lower end of the lamp 58 with base pins 55' and 56' properly aligned in the plane of a lower mount 59', is slid inwardly over the lower chuck 21. The lower chuck 21 is then slowly raised, allowing the base pins 55' and 56', still aligned with respect to a mount 59', to slip easily into centering

slots 79 of a lower pin guide plate 75 of a lower chuck 21.

Thus it will be seen from the foregoing description that our invention has provided an air-cooled upper chuck 20 and a lower spring-supported chuck 21 for a basing machine 10, which have hardened pin guide plates 50 and 75 for reducing maintenance on the chucks and improving base pin alignment over a long period of time. Both upper and lower chucks 20 and 21 are provided with air streams near the end of the basing cycle to cool and set the baked cement, cool the lamp stem and the base to prevent blistering and remove any evolved potentially explosive alcohol vapor from the basing area which retards the setting of the cement.

Although a preferred embodiment of our invention has been described, it will be understood that modifications may be made within the spirit and scope of the appended claims.

We claim:

1. In combination a standard, a carrier rotatable thereabout, and having a hollow outer casing and a peripheral head supporting flange with a plurality of apertures therein, a plurality of upper chucks, one for each aperture, secured to said head supporting flange and adapted to be cooled by a cooling air stream, a plurality of reciprocable lower chucks, one for each upper chuck, carried by the lower portion of said casing and adapted to be cooled by a cooling air stream, for holding fluorescent lamps and their based ends received within said upper and lower chucks; each of said lower chucks having a hollow cup-like body provided with a peripheral mounting flange and a washer-like bottom portion, a plurality of upstanding base supporting ribs on said bottom portion for eliminating contact between a base provided with basing cement and said bottom portion, a diametrical hardened pin guide plate bridging said bottom portion and provided with base pin locating slots and an air blast hole in registry with a delivery hole in said base, and an air stream riser secured in said air blast hole of said guide plate to direct air into said base to cool said base and remove alcohol vapors evolved from said basing cement during the heating operation through the unsoldered base pins of said base, and means contiguous to said carrier for directing a cooling air stream through said lower chuck air stream risers.

2. In combination a standard, a carrier rotatable thereabout, and having a hollow outer casing and a peripheral head supporting flange with a plurality of apertures therein, a plurality of upper chucks, one for each aperture, secured to said head supporting flange and adapted to be cooled by a cooling air stream, a plurality of reciprocable lower chucks, one for each upper chuck, carried by the lower portion of said casing and adapted to be cooled by a cooling air stream, for holding fluorescent lamps and their based ends received within said upper and lower chucks; each of said upper chucks having a hollow cup-like body provided with a washer-like top portion and a peripheral mounting flange extending from said top portion, a plurality of depending base supporting ribs on said top portion for eliminating contact between a base provided with basing cement and said top portion, a diametrical hardened pin guide plate bridging said top portion and provided with base pin locating slots and an air blast hole in registry with a delivery hole in said base, and an air stream riser secured in said air blast hole of said guide plate to direct air into said base to cool said base and remove alcohol vapors evolved from said basing cement during the heating operation through the unsoldered base pins of said base, and means contiguous to said carrier for directing a cooling air stream through said upper chuck air stream risers.

3. A basing machine lower chuck for a fluorescent lamp base provided with unsoldered base pins and an air delivery hole and adapted to be cooled by a cooling air stream and having a hollow cup-like body provided with a peripheral mounting flange and a washer-like bottom portion, a plurality of upstanding base supporting ribs on said bottom portion for eliminating contact between a base provided with basing cement and said bottom portion, a diametrical hardened pin guide plate bridging said bottom portion and provided with base pin locating slots and an air blast hole in registry with said delivery hole in said base, and an air stream riser secured in said air blast hole of said guide plate to direct air into said base to cool said base and remove alcohol vapors evolved from said basing cement during the heating operation through the unsoldered base pins of said base.

4. A basing machine upper chuck for a fluorescent lamp base provided with unsoldered base pins and an air delivery hole and adapted to be cooled by a cooling air stream and having a hollow cup-like body provided with a washer-like top portion and a peripheral mounting flange extending from said top portion, a plurality of depending base supporting ribs on said top portion for eliminating contact between a base provided with basing cement and said top portion, a diametrical hardened pin guide plate bridging said top portion and provided with base pin locating slots and an air blast hole in registry with said delivery hole in said base, and an air stream riser secured in said air blast hole of said guide plate to direct air into said base to cool said base and remove alcohol vapors evolved from said basing cement during the heating operation through the unsoldered base pins of said base.

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