Feb. 24, 1942. M. J. N. DE MARGITTA 2,274,400

MANUFACTURE OF PHOTOFLASH LAMPS

Filed Jan. 26, 1940

Fig. 1.

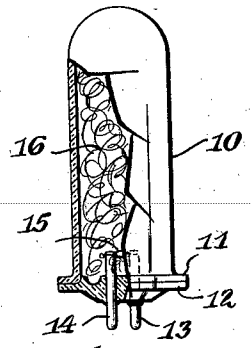
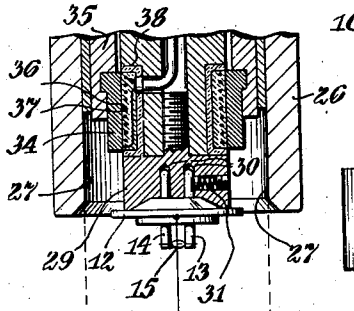


Fig. 2.



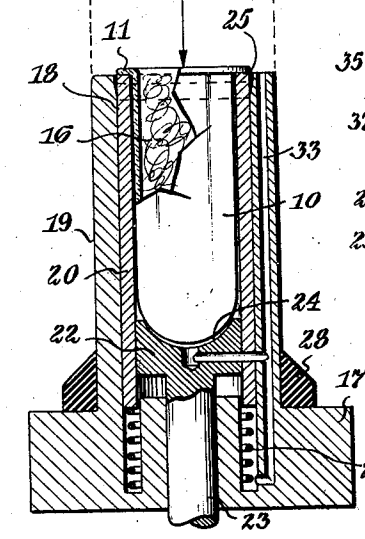


Fig. 3.

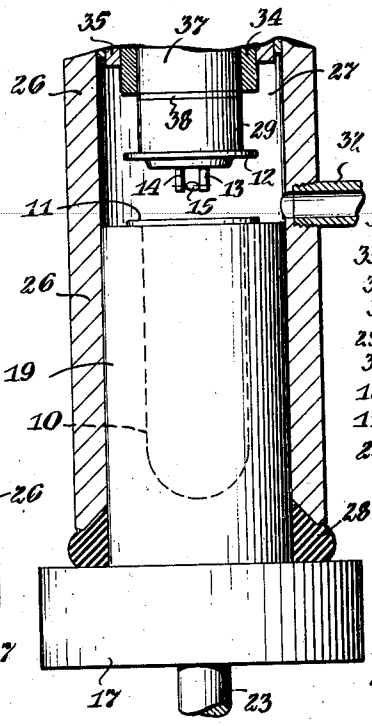


Fig. 4.

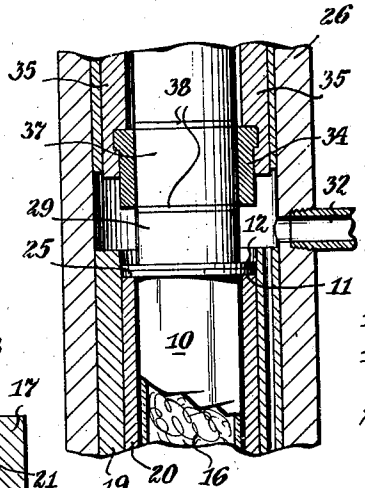


Fig. 5.

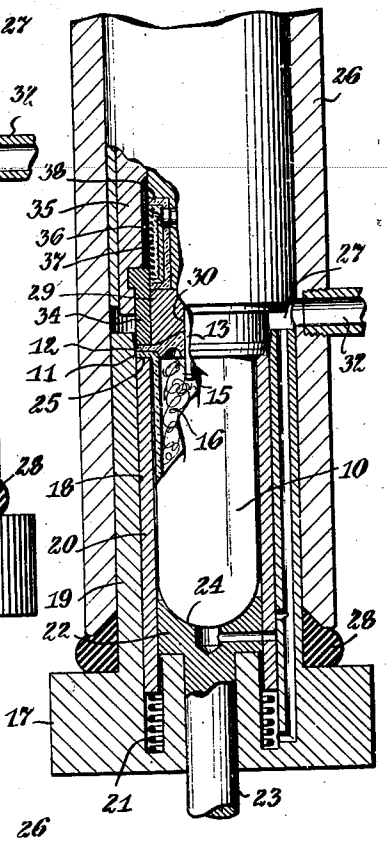
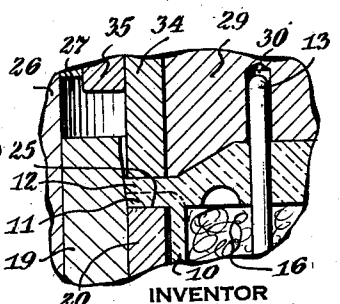


Fig. 6.



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MANUFACTURE OF PHOTOFLASH LAMPS

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Application January 26, 1940, Serial No. 315,740
In Hungary September 5, 1939

8 Claims. (Cl. 226—20)

This application is a continuation-in-part of my copending application on improvements in Flashlamps, Serial No. 298,276, filed October 6, 1939.

The invention relates to lamps, and especially to photoflash lamps. An object of the invention is to provide a machine assembly for a cheap and quick manufacture of photoflash lamps in quantity.

Other objects and advantages of the invention will be apparent from the following description and drawing in which;

Figure 1 is a front elevation with parts broken away of a preferred form of photoflash lamp.

Figure 2 is a cross-sectional view through a preferred type of apparatus for assembling the photoflash lamp of Figure 1.

Figures 3, 4 and 5 are views in cross-section illustrating the various steps in the manufacture of the photoflash lamp with the apparatus illustrated in Figure 2.

Figure 6 is an enlarged detailed view of the rim sealing step in the assembly of the photoflash lamp.

In Figure 1 is illustrated a preferred type of photoflash lamp described in my above-referred to application. This photoflash lamp comprises a closed end tubular casing or envelope 10 of plastic material, preferably cellulose acetate, although various other compounds of the plastic group formed from resins, casein, pyroxylyn, shellac, etc. may be used.

The tubular casing or envelope 10 has a flange 11 at the open end which is sealed by a disk 12, also preferably of a plastic material such as cellulose acetate, and two conductors 13 and 14 are sealed through this bottom disk. The conductors have an igniting material 15, such as a filament surrounded by a mixture of zirconium, aluminum or phosphorous powder, connected across their inner terminals for the purpose of igniting a combustible material 16 such as a film or fine wires of either aluminum or magnesium.

The interior of the lamp is filled with an active gas such as oxygen, which may be below, at or above atmospheric pressure, and preferably above, even up to ten atmospheres.

This application, in particular, describes a preferred apparatus for quickly and cheaply manufacturing such a flashlamp in quantity production. The machine comprises a lower base portion 17 whose upright projecting portion 19 has a central opening 18 therein, extending downwardly. Within the central opening 18 is a movable sleeve 20 having an inner diameter approximately the outer diameter of the tubular casing or envelope 10 of the flashlamp. This movable sleeve 20 is preferably supported on a spring 21, from the bottom portion of the base 17.

In the bottom of the opening 18 is a movable member 22, having a central shaft 23, extending through the bottom of the base member 17, for the purpose of expelling when desired, the contents within the sleeve 20. The top portion 24, of this member 22, is contoured to receive the top or envelope of the photoflash lamp, which is inserted with its top downward within the sleeve 20. The position of the member 22 within this base member, is so that the flange 11 will rest upon the upper edge 25 of the sleeve 20.

The tubular casing or envelope 10 has been filled with the combustible material 16, either prior to or after the tube has been inserted in the lower form 17. The upper member comprises tubular member 26 having a central opening 27 of a diameter to fit snugly around the projection 19 of the lower base member. The lower member 17 has a compressible material 28, such as rubber, around the base of the projection 19 whereby the tubular member 26 may be forced into a substantially air-tight seal with the lower member 17, as is illustrated in Figs. 3 and 5.

Within the central bore 27 of the upper member, is a central projection 29 having two holes 30 therein, in which the exterior connections of the conductors 13 and 14 may be inserted and held therein, under some securing means, such as the spring 31.

It will be noted that the base member 12 is thus held directly above the tubular portion 10, with the igniting means 15 pointing towards the interior of the tube held in the lower portion 17.

The sleeve 26 is lowered about the tubular projection 19, and the rubber material 28 is compressed into the substantially air-tight arrangement, as disclosed in Figure 3.

It will be noted that the surrounding sleeve 26, has a port 32, located just above the flange 11 of the inverted tubular casing 10 when this sleeve is lowered into the position of Fig. 3. The bottom disc 12 with its igniting assembly, is lowered, as illustrated in Figure 3, until it is in the neighborhood of this port. The central space 27 is substantially air-tight. The port 32 is connected to an exhausting machine for the removal of the air from the inner tube 11. Various ducts 33 are located in the lower case member 17, so that there will be no air pockets about the tubular casing 10 to cause adulteration of the active gas.

After the air has been exhausted, an active gas is inserted through the port 32 to fill the interior tube 10 to the desired pressure. As previously stated, this atmosphere may be oxygen and preferably oxygen at a pressure greater than atmospheric.

The igniting device 15 on its base 12 is then lowered into the tubular casing 10, so that the periphery of the base 12 presses against the upper surface of the flange 11. A movable sleeve 34 is then lowered to press the base 12 against

the flange 11, as illustrated in Figure 5. This sleeve may be moved by another sleeve 35, which is capable of exerting a considerable pressure upon the plastic flange 11 and periphery of the base 12.

I prefer to locate about the periphery of the central member 29, a heating device 36, such as a coil of wire embedded in heat-conducting material 37 surrounded by heat insulation 38, to block to some extent the undesired escape of heat through the inner portions of the member 29. This heating means is in contact with the movable sleeve 34, which is of a material, such as copper, that will readily conduct the heat from the heating means to the plastic material. This material may also be of that used for high speed steels, chromium-silver-copper alloys, etc., that withstand the heat applied without oxidizing. The other parts may be of brass, steel or other suitable metals or alloys. The electric heater could be embedded in this material instead of in the central shaft.

An enlarged portion of the bottom edge of the flashlamp, is disclosed in Figure 6. The hot cylinder 34 is pressing downward on the upper disc 12 in contact with the flange 11 of the tubular casing 10. Under both the heat and pressure, the plastic material softens and then forms a homogeneous mass sealing the active gaseous atmosphere within the plastic casing 10.

The compression means, which may be manual, pneumatic or hydrostatic, upon the bottom disc 12 and the flange 11, is removed and then the upper portion of the assembling machine raised and the sealed and completed lamp is removed from the apparatus. While the sealing means has been shown as a single unit, it may be one unit in a multi-head machine.

It is apparent, many modifications may be made in the particular form and method of assembling this device, and accordingly I desire only such limitations to be imposed upon the preferred method and apparatus described herein, as are necessitated by the spirit and scope of the following claims.

I claim:

1. The method of assembling the flanged envelope and base of a flashlamp, which comprises juxtaposing an annular laterally projecting area of the flange upon a support thereby supporting the flanged end of the envelope directly by its flange, juxtaposing the rim of the base adjacent to the laterally projecting area of the flange, enclosing both the envelope and base, exhausting the atmosphere in said envelope and replacing it with an active gas, bringing the rim of the base into facial contact with the laterally projecting area of the flange, applying heat, and applying opposing pressure directly on the projecting area of the flange and on the rim of the base next the peripheries thereof for squeezing those parts together and thereby sealing the flashlamp.

2. Apparatus for assembling the envelope having a flange and the base of a flashlamp which comprises a member supporting said flange, a second member supporting said base adjacent said flange, a third member enclosing said other members, envelope and base air tight, means for filling said third member, including said envelope with an active gas, and means for applying said base to said flange with heat and pressure to seal said envelope and base together.

3. Apparatus of the class described comprising a cylinder having a hollow center to hold one part to be sealed, a holding member for the other part having heating means therein adjacent said cylinder, a sleeve surrounding said holding member, having substantially the diameter of said first-mentioned cylinder and movable closely adjacent the edge of said cylinder whereby the heat is concentrated on the two parts to be sealed, and a substantially air-tight enclosure member for said elements precedingly mentioned, said enclosure member having a port for exhausting and filling purposes.

4. Apparatus for assembling the envelope of a lamp to a lamp base comprising a base member supporting said envelope, a movable member holding said lamp base above said envelope, a movable sleeve pressing said lamp base on said envelope and heating means within said movable sleeve whereby said envelope and lamp base are sealed together.

5. Apparatus for assmbling the envelope of a lamp to a lamp base comprising, a base member supporting said envelope, a movable member holding said lamp base above said envelope, a movable sleeve pressing said lamp base on said envelope, heating means within said movable sleeve whereby said envelope and lamp base are sealed together, and a substantially air-tight casing enclosing the preceding envelope, lamp base, member, sleeve and heating means, said casing having a port for exhausting and filling purposes.

6. Apparatus for assembling the envelope of a lamp to a lamp base comprising a base member having a sleeve member supporting an edge of said envelope, an upper assembly, said upper assembly having an enclosing member surrounding the portion of said base member having said sleeve member, a movable sleeve member in said upper assembly having its edge adjoining the edge of said sleeve member in the base member and a supporting member in said upper assembly lowering the lamp base on the edge of the envelope for sealing said envelope and lamp base together.

7. Apparatus for assembling the envelope of a lamp to a lamp base comprising a base member having a sleeve member supporting an edge of said envelope, an upper assembly, said upper assembly having an enclosing member surrounding the portion of said base member having said sleeve member, a movable sleeve member in said upper assembly having its edge adjoining the edge of said sleeve member in the base member, a supporting member in said upper assembly lowering the lamp base on the edge of the envelope, and means for supplying heat to one of said sleeve members whereby said envelope and base are sealed together.

8. Apparatus for assembling the envelope of a lamp to a lamp base comprising a base member having a sleeve member supporting an edge of said envelope, an upper assembly, said upper assembly having an enclosing member surrounding the portion of said base member having said sleeve member, a movable sleeve member in said upper assembly having its edge adjoining the edge of said sleeve member in the base member and a supporting member in said upper assembly lowering the lamp base on the edge of the envelope, and means for supplying heat and pressure to one of said sleeve members whereby said envelope and base are sealed together.

MICHAEL J. NEUMANN DE MARGITTA.