

[54] **ARRANGEMENT FOR THE
INTRODUCTION OF MATERIALS IN AN
ELECTRIC DISCHARGE VESSEL**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.**..... **313/177**

[51] **Int. Cl.**..... **H01j 61/28**

[58] **Field of Search**..... 313/177; 417/48,
417/51; 206/16.6

[56] **References Cited**

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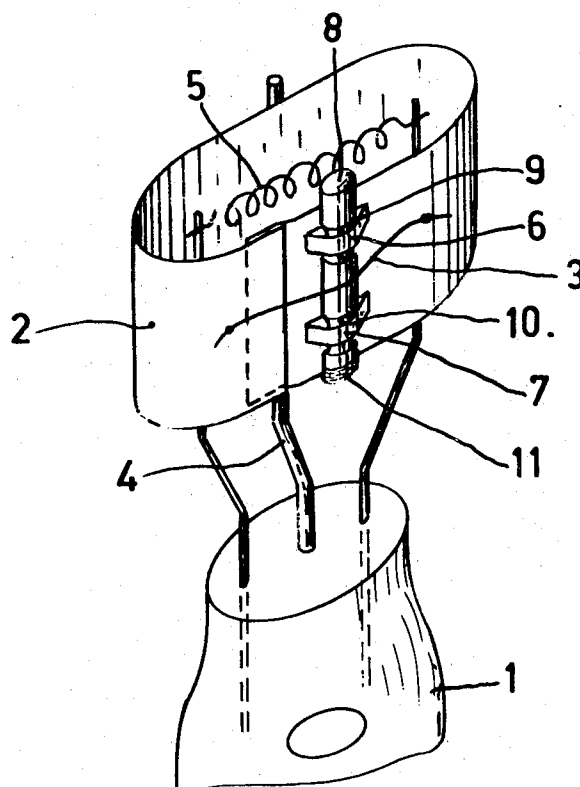
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[57] **ABSTRACT**

An improvement in an arrangement for the introduction of materials into a closed electric discharge vessel. The arrangement includes a closed holder containing preselected material to be introduced into the vessel and a secondary coil element placed in contact with the holder which element includes a heating wire for decomposing the wall portions of the holder. The heating wire is activated by the induction of current in the secondary coil by a primary coil which is external to the electric discharge vessel. The invention encompasses improvement in the shape of the holder and the positioning of the holder. A particular embodiment of the invention involves constricted portions of the holder which cooperate with lugs extending from a strip-shaped secondary coil section. This arrangement effects substantially improved positioning of the holder after the materials within the holder are released into the vessel.

4 Claims, 3 Drawing Figures



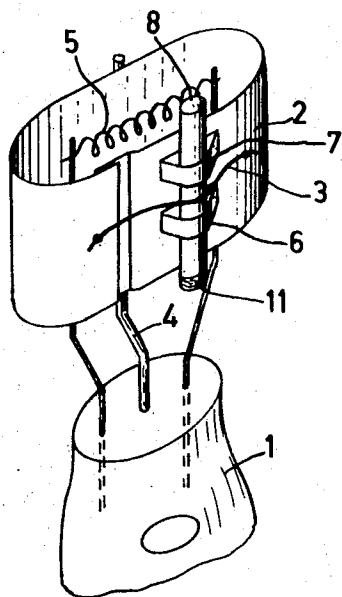


Fig. 1

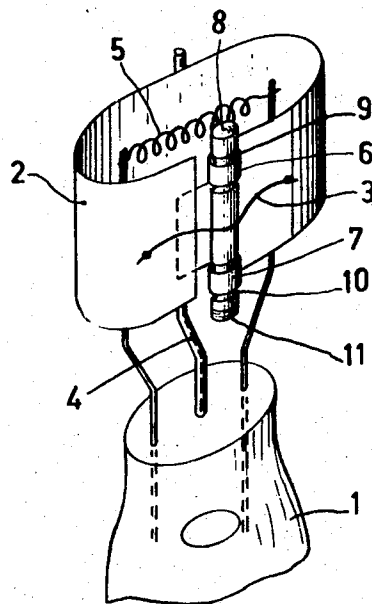


Fig. 3

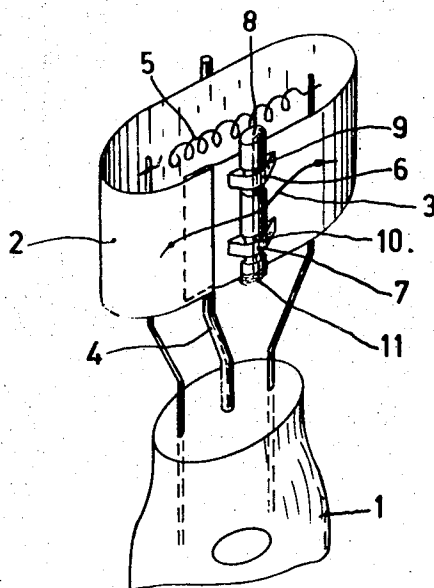


Fig. 2

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ARRANGEMENT FOR THE INTRODUCTION OF MATERIALS IN AN ELECTRIC DISCHARGE VESSEL

The present case relates to U. S. Application Ser. No. 49,379 which is now abandoned in favor of continuation application Ser. No. 271,058 and divisional application Ser. No. 270,340. These cases relate to a method and arrangement for manufacturing an electric discharge vessel, starting from a vessel in which a closed holder is placed which is provided with a quantity of one or more materials to be introduced into the vessel. Furthermore the main application relates to an electric discharge vessel manufactured by such a method. The present invention relates to an improvement in such a discharge vessel, particularly an improvement in a low-pressure mercury vapour discharge lamp.

In a special embodiment of a discharge vessel according to the main application the holder is a mainly cylindrical capsule and a wire-shaped heating element is provided which forms part of a secondary coil consisting of a single closed turn and placed in the vessel, in which coil a current can be generated by induction with the aid of a primary coil placed outside the vessel. The part of the secondary coil which is not wire-shaped is strip-shaped in this preferred embodiment. The heating element is connected to the strip in an electrically conducting manner such that the said closed turn is produced. The holder for the material(s) to be introduced is in thermal conducting contact with the wire-shaped heating element so that upon heating of this element when a current is generated in the coil said element can cut through the wall of the capsule whereby the material(s) to be introduced can be released in the discharge vessel. In accordance with a preferred embodiment of a vessel according to the main application the strip is provided with lugs encompassing the capsule in order to keep the capsule in position.

When the heating element cuts through the wall of the capsule, which wall is generally made of glass, there is the risk that the capsule breaks into two parts and that these parts are released from the lugs and come in the discharge vessel. This is of course a drawback because such loose parts may damage, for example, the cathodes or a luminescent layer which, as is known, is generally present in low-pressure mercury vapour discharge lamps. In order to obviate this drawback in accordance with a given embodiment of a discharge vessel according to the main application a thin wire is sealed in the capsule in such a manner that it intersects the heating element. If the capsule breaks, the two parts remain connected by this extra wire and cannot come in the discharge vessel. The use of such a wire has the following drawbacks. Firstly the insertion of such a thin wire into the tube from which the capsule must be formed is difficult and requires fairly intricate equipment which is difficult to adjust on a machine on which the capsules are manufactured in bulk quantities at a fast rate. In fact, the internal diameter of the capsule is generally small and is often between 0.5 and 4 mm. A second drawback is that sealing of the capsule becomes more difficult so that the risk of leaky capsules is increased. In addition the glass head on the sealed ends has a less defined shape which causes difficulties when mounting the capsules on the strip-shaped part of the secondary coil. A further drawback is that in some cases the hot heating element, generally a molybdenum

wire, may fuse the extra wire in the capsule generally consisting of copper clad wire. Then the parts of the capsule can still come loose. All these drawbacks may be obviated with the aid of a construction according to the present invention.

An electric discharge vessel manufactured by a method according to the Netherlands Patent Application 6909890 which method starts from a vessel in which a closed holder is placed which is provided with a quantity of one or more materials to be introduced into the vessel and in which subsequently a desired gas atmosphere is brought about whereafter the vessel is closed and in which finally the holder is opened by the passage of current through a heating element present in the vessel is characterized according to the improvement in that the heating element is wire-shaped and forms part of a secondary coil consisting of a closed turn and placed in the vessel, in which coil a current can be generated by induction with the aid of a primary coil placed outside the vessel, the holder being mainly a cylindrical capsule and the part of the secondary coil not consisting of the heating wire being strip-shaped and having at least two lugs which engage constricted parts of the capsule.

In order that the invention may be readily carried into effect, some embodiments thereof will now be described in detail by way of example with reference to the accompanying diagrammatic drawing in which:

FIG. 1 shows the stem with the electron system for a low-pressure mercury vapour discharge lamp according to the main application;

FIG. 2 shows a stem for a low-pressure mercury vapour discharge lamp according to the improvement and

FIG. 3 shows a further embodiment of a stem for a low-pressure mercury vapour discharge lamp according to the improvement.

In FIG. 1 a secondary coil is mounted on a pinch 1, which coil consists of a strip-shaped part 2 and a heating wire 3. Strip 2 is secured to the pinch with the aid of a supporting terminal 4. The reference numeral 5 denotes a cathode shown diagrammatically. Two lugs 6 and 7 are depressed in the strip 2 so that they can encompass a capsule 8 which contains a quantity of mercury 11 to be introduced into the discharge vessel. This capsule is slid under the lugs 6 and 7 during manufacture. The heating wire 3 then engages the wall of the capsule 8. To open the capsule an induction current is generated in the coil consisting of the heating wire 3 and the strip 2, which induction current has such a value that the wire 3 is brought to incandescence. This wire 3 then cuts through the capsule 8. If the capsule is cut through completely, or breaks into two parts the lower and upper parts of the capsule may get loose from the lugs 6 and 7 and come in the discharge vessel. This drawback is obviated in a construction according to the improvement as is shown in FIG. 2. In this Figure the same reference numerals are used for those components which are also shown in FIG. 1. The capsule 8 is provided with constricted parts 9 and 10 at the area of the lugs 6 and 7, respectively. It is evident that even when the heating wire 3 cuts through the capsule the two parts of the capsule cannot get loose from the lugs 6 and 7.

FIG. 3 shows a further embodiment of a discharge vessel according to the improvement. Also in this Figure the same reference numerals have been used for corresponding parts of the construction. The difference

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with the construction of FIG. 2 is that the lugs are constituted by the parts of the edges at one end of the strip-shaped part 2 of the secondary coil. As compared with the construction of FIG. 2 this provides the advantage that it is easier to make the lugs 6 and 7 and to mount the capsule on the strip 2. In fact, the lugs 6 and 7 can then be bent about the constricted parts of the capsule. This is easier than sliding the capsule as would be necessary in the construction according to FIG. 2. In the construction according to FIG. 2 the lugs must sometimes be pressed after the capsule has been placed on the strip 2. It is not necessary for the lugs 6 7 to be formed from the sides of the strip 2; they may alternatively be formed from the intermediate part of the relevant end of the strip 2.

The constricted parts of the capsule may have the shape of a ridge as is shown in FIGS. 2 and 3, but this is not necessary. Differently shaped constrictions may lead to the object of the invention, namely to prevent parts of the capsule from getting loose from the strip and coming in the discharge vessel.

What is claimed is:

1. In an arrangement for the introduction of a predetermined quantity and type of materials into a closed lamp vessel wherein a closed holder containing preselected materials to be introduced into said vessel is

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mounted, the holder being in pressable contact with a wire-shaped heating element forming a part of a secondary coil consisting of a single turn, said heating element adapted to being heated by current flow in the secondary coil induced by a primary coil external to the vessel, the improvement comprising that the holder is substantially cylindrical in shape and having at least two portions of the holder of substantially narrower diameter than the remainder of the capsule, part of the secondary coil excluding the heating wire being strip-shaped and having at least two lugs which engage the narrow diameter portions of the holder, whereby upon induction of current in said secondary coil, said heating wire decomposes the walls of the holder to release said materials, the separated sections of the holder being held in place by the lugs.

2. The arrangement as claimed in claim 1 wherein the lugs are provided at one of the ends of the strip-shaped part of the secondary coil.

3. The arrangement as claimed in claim 2 wherein the lugs are provided at the edges of the relevant end of the strip-shaped part of the secondary coil.

4. A capsule for use in a discharge vessel as claimed in claim 1 wherein the capsule is provided with at least two constricted parts.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,764,842

Dated October 9, 1973

Inventor(s) Johannes Antonius Maria Ridders et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 12, "6 7" should read -- 6 and 7 --.

Signed and sealed this 5th day of March 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents