Oct. 24, 1967 W. F. TER HOEVE 3,349,277

ELECTRIC LAMP WITH EXTERNAL CURRENT SUPPLY CONTACT

Filed Nov. 2, 1964 3 Sheets-Sheet 1

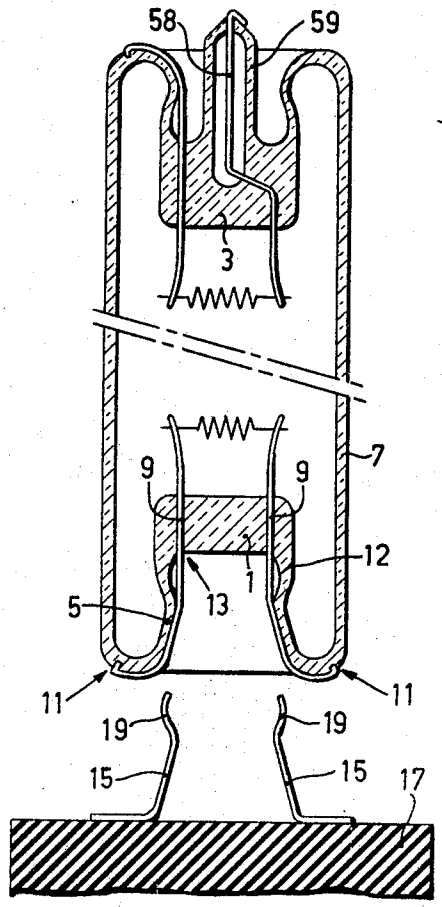

FIG. 1

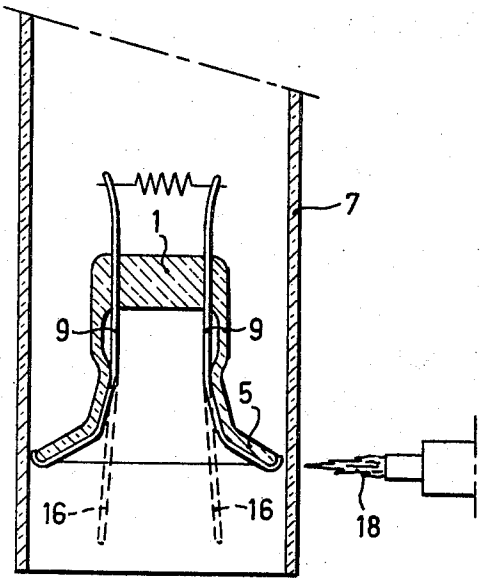

FIG. 2

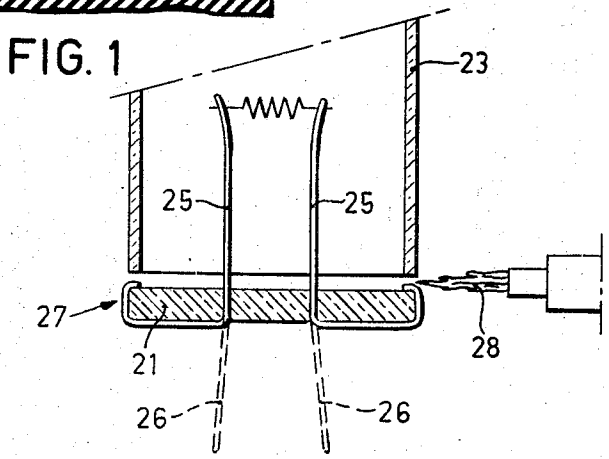

FIG 3

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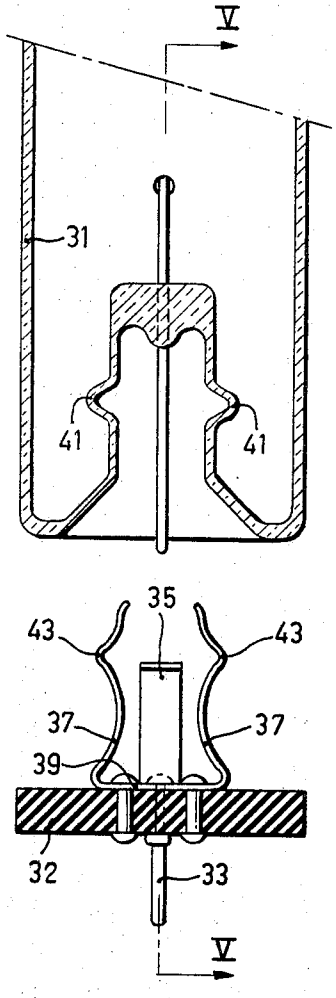

FIG. 4

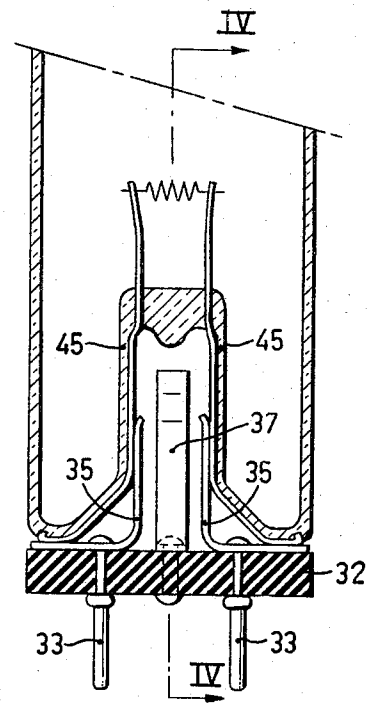

FIG. 5

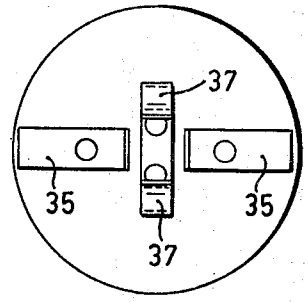

FIG. 6

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ELECTRIC LAMP WITH EXTERNAL CURRENT SUPPLY CONTACT

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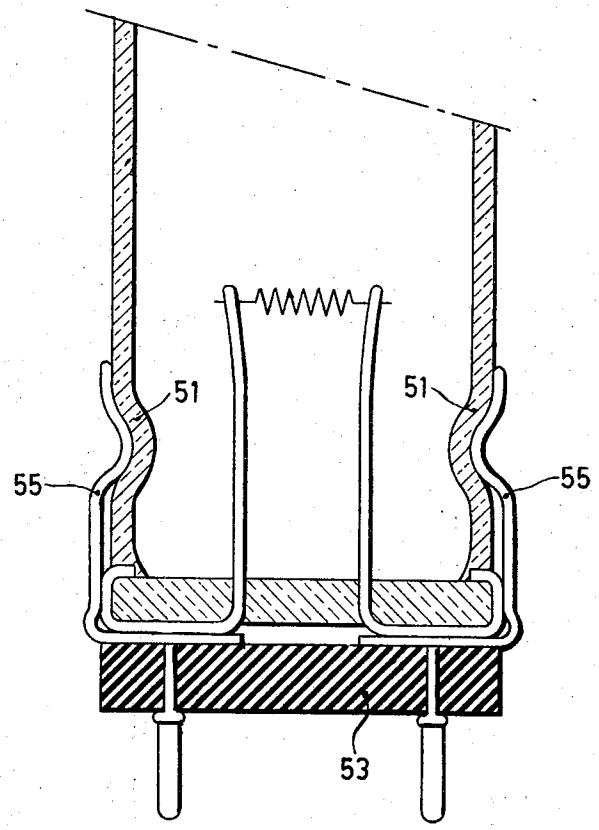

FIG. 7

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ELECTRIC LAMP WITH EXTERNAL CURRENT SUPPLY CONTACT

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6 Claims. (Cl. 313—318)

ABSTRACT OF THE DISCLOSURE

An electric lamp in which the current conductors extend along and are contiguous with an external surface of a lamp stem which forms one end of the lamp, only the ends of the conductors being sealed between a flange of the stem and the envelope and providing thereby an external electrical terminal for the lamp.

The invention relates to an electric lamp or discharge tube, the vessel of which is formed by a bulb and one or more stems provided with a flange-shaped part, sealed to the bulb of the lamp or tube, the current supply contacts being formed by those parts of the current supply conductors sealed in one or more stems which are located outside the vessel of the lamp or tube. With such a lamp or tube, known as capless lamps or tubes the emerging current conductors themselves serve as current supply contacts. With the known lamps or tubes the term "stem" is to denote, in general, a closing member provided with a flange and supporting the light emitting part and provided frequently with a tube. During the manufacture of such a lamp or tube, usually the widest part of the stem is sealed to the bulb. The flange may have a flat or conical shape.

With the known lamp or tube the ends of the more or less flexible current conductors emerging from the vessel must be arranged in position relatively to the vessel by a separate operation in order to secure them to the lamp or tube vessel by separate means. In this manner it is ensured that the current conductors remain at their predetermined places. This is important because with such a lamp or tube the contact members must be capable of establishing a rigid contact with the conductors serving as external current supply contacts.

The invention has for its object to provide a lamp or tube structure in which the subsequent connection of the emerging, more or less flexible current supply conductors with the aid of separate fastening means can be completely dispensed with.

The lamp or tube according to the invention is characterized in that at least part of the current conductors serving as external supply contacts is sealed in the sealing zone between the stem concerned and the bulb of the lamp or tube. Before the stem is sealed to the bulb, the ends concerned of the supply conductors are held in the sealing zone between the stem and the bulb and subsequently, the flange-shaped part of the stem is sealed to the bulb. In this manner the ends of the supply conductors can be rigidly secured to the vessel of the lamp or tube.

In a further embodiment of the lamp or tube according to the invention the current conductors extend along the side of the flange-shaped part remote from the interior of the vessel. Consequently, the external current conductors of such a lamp or tube will be taut to a greater or lesser extent between the place where the conductors emerge from the vessel and the zone where the ends of the conductors are sealed in the sealing zone. Thus not only the ends but also the more or less taut parts of

the conductors stay at their predetermined places when a rigid electric contact is established. The wall of the vessel may serve as a support for the conductors when the contact is established.

For suitably fastening the lamp or tube according to the invention for example in a holder of a lighting fitting, for instance, the vessel is provided near the sealing zone with interrupted or non-interrupted local variations of the profile. Said variations may be provided in the wall of the bulb, for example in the case of flat, flange-shaped stem portions of stem supports. The profile variations may, however, also be provided at the area of the flange-shaped portion, for example, if the latter is funnel-shaped, for example in the case of stem tubes. The use of such profile variations, which may be formed by grooves extending transversely of the longitudinal direction of the vessel, by depressions or by protuberances, permits in particular of obtaining a rigid snap joint between the lamp or tube and, for example the holder of a lighting fitting.

With the lamp or tube according to the invention the two current conductors emerging from the stem can be arranged at their ends in the sealing zone. As an alternative, in a further embodiment of the lamp or tube according to the invention one of the current conductors is arranged in the sealing zone of the vessel, whereas the other conductor emerges through the exhaust tube associated with the stem.

The invention also applies to lamps or tubes comprising the conventional cap or base. In the embodiment concerned the vessel is provided with a cap or base or the like fastened by a snap joint, the side facing the vessel being provided with contact members co-operating with current conductors on the outer side of the vessel, serving as external current supply conductors. With such lamps or tubes comprising a cap or base or the like an important advantage is obtained as compared with the conventional capped lamps or tubes, in that a few conventional operations may be omitted. These operations are, for example, the introduction of a current conductor emerging from the vessel through a narrow opening of a cap or fitting and the cutting off of the conductor and the fastening of the end of a conductor to the cap or base. Owing to the snap joint a further conventional operation, the so-called capping may be dispensed with.

The invention will be described more fully with reference to the drawing, which shows a few embodiments.

FIG. 1 shows a lamp in which the ends of the current conductors are arranged in sealing zones in accordance with the invention.

FIG. 2 illustrates the possible arrangement of the ends of the current conductors emerging from a lamp vessel in the sealing zone.

FIG. 3 illustrates the arrangement of current conductors emerging from the stem system in the sealing zone between the stem system and the wall of a tube.

FIGS. 4, 5 and 6 show a lamp with a cap; FIG. 4 is a sectional view taken on the line IV—IV of FIG. 5 and FIG. 5 is a sectional view taken on the line V—V in FIG. 4.

FIG. 6 is a plan view of the associated cap, which is shown in FIG. 4 separately from the lamp.

FIG. 7 shows a tube provided with a cap.

The lamp shown partly in FIG. 1 comprises stems 1 and 3, each having a funnel-shaped portion 5 and being sealed with their widest circumference to a glass bulb 7. A number of current conductors 9 emerge from each stem.

In accordance with the invention the free ends of the conductors are arranged at 11 in the sealing zone between a stem (1 or 3) and the bulb 7, so that the portions of

the current conductors located between the place of emergence **13** and the zone **11** can establish an external electric contact without the conductors being shifted in place. Consequently, some of the conductors may serve as external current supply contacts.

The arrangement of the ends of the more or less straight conductors **16** in the sealing zone **11** is illustrated in FIG. 2. First the conductors **16** emerging from the stem **1** are stretched around the widest edge of a funnel-shaped portion **5**. Then the glass stem **1** is arranged with its flange-shaped portion **5** inside the bulb **7**. Subsequently, with the aid of flames **18** the stem **1** is sealed to the bulb **7**. Consequently, the ends of the conductors **9** are fastened simultaneously with the seal between the stem **1** and the bulb **7**. This fastening does therefore not require a separate operation.

FIG. 3 shows the situation for sealing a stem formed by a support **21** to a bulb **23**. Conductors **25** and **26** emerge from the support **21**. Before the sealing operation, said conductors are bent around the edge of the flat flange (at **27**). Then the bulb **23** is disposed on the edge of the support **21**. By means of flames **28** the sealing operation is then performed. Also in this case the ends of the conductors **26** are held in the sealing zone.

The lamp shown in FIG. 1 can be mounted in a holder **17** by snapping the vessel onto the resilient contact tags **15** of said holder. The bent-over parts **19** of the tags **15** will urge the conductors concerned into the profile variations at **12**, so that a rigid contact is established with the conductors **9**. Consequently, in the structure shown in FIG. 1, the two functions i.e. fastening of the lamp vessel to the holder of a lighting fitting and the establishment of an electric contact can be fulfilled by the same resilient tags.

The invention is also suitable for lamps and tubes having a cap, base or the like for mounting in conventional lighting fittings, holders and the like. In this case also the cap, base or the like must be provided with contact members capable of establishing an electric contact with the current conductors serving as external current supply contacts for the lamp or tube vessel. The cap, base or the like must be connectable to the vessel. Such a cap, base or the like slightly resembles the holder **17** of FIG. 7, but it must also be provided with for example external contact pins and external screw thread or the like. With the lamp shown in FIGS. 4 and 5 this is shown for the cap **32** of electrically insulating material, provided with contact pins **33**.

With the lamp shown in FIGS. 4, 5 and 6 the two functions i.e. the establishment of an electric contact and the fastening of the cap **32** to the vessel are fulfilled by different members. The contact pins are electrically coupled with resilient tags **35**. The cap **32** is furthermore connected to a bracket provided with two further resilient tags **37**. The wall of the vessel **31** has two grooves **41**. By disposing the cap **32** on the vessel **31** in the position shown in FIG. 5 the bent-over portions **43** of the tags **37** can snap into the grooves **41**. The tags **35** thus establish a rigid electric contact with the conductors **45**.

For fastening a suitable cap or base to the lamp or tube according to the invention the interrupted or non-interrupted local profile variations may, of course, also be provided in the wall of the bulb of the lamp or tube. This is shown for the gas discharge lamp illustrated partly in FIG. 7. The upright side wall of the lamp has a fluted portion **51**, into which can snap resilient tags **55**, fastened to the cap **53**, when the cap **53** is disposed on the lamp. The electric contact is thus again established by means of only one set of resilient tags.

In the foregoing it is supposed that each current conductor emerging from a stem is guided along the flange-shaped portion of the stem and that the end is arranged in the sealing zone. However, the invention also applies to the case in which at least one of the conductors (**58**) emerges through a stem (**59**) of the support **3**, which is shown by way of example in FIG. 1.

What is claimed is:

1. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, and a current conductor sealed in said stem and having a portion external to and contiguous with said stem serving as an external current contact, said external portion of said current conductor being sealed only at the end thereof between the flange and the bulb.

2. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, and a current conductor sealed in said stem and having a portion extending contiguously along an external surface of the flange serving as an external current contact, only the end of said conductor being sealed between the flange and the envelope.

3. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, and a current conductor sealed in said stem and having a portion extending contiguously along an external surface of the flange serving as an external current contact, only the end of said conductor being sealed between the flange and the envelope, the envelope having an interrupted profile variation in the vicinity of the seal between the flange and the envelope.

4. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, and a current conductor sealed in said stem and having a portion extending contiguously along an external surface of the flange serving as an external current contact, only the end of said conductor being sealed between the flange and the envelope, the envelope having an uninterrupted profile variation in the vicinity of the seal between the flange and the envelope.

5. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, said stem having an exhaust tube, a first conductor extending through said exhaust tube, and a second current conductor sealed in said stem and having a portion external to said envelope and contiguous with said stem serving as an external current contact, only the end of said external portion of said second conductor being sealed between said envelope and said stem.

6. An electric lamp comprising an envelope, a stem having a flange portion sealed to said envelope, a conductor sealed in said stem and having a portion external to and contiguous with said stem the end only of which is sealed between the flange and the envelope, a member fitting over said flange, and a current contact member on the side of said member facing said flange positioned to cooperate with said external conductor to provide an external current supply contact for said lamp.

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