Nov. 17, 1959 R. T. PENNOYER 2,913,102

GETTER ASSEMBLAGE

Filed Dec. 30, 1957

FIG.1.

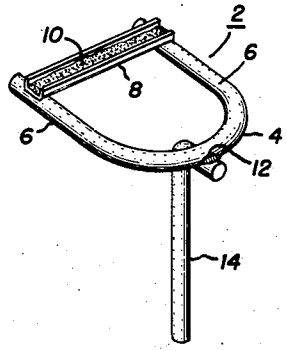


FIG.2.

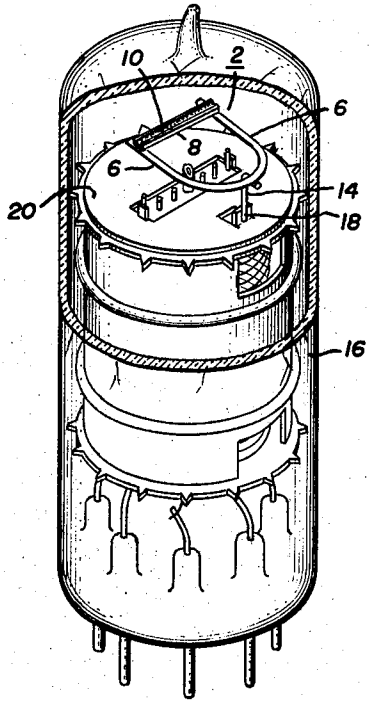


FIG.3.

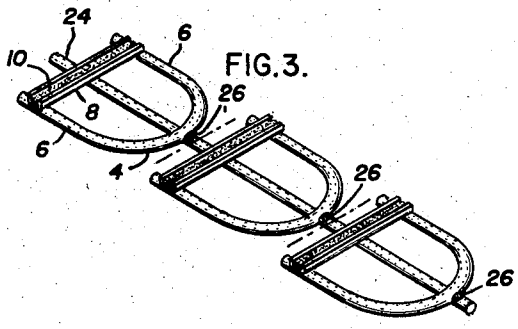
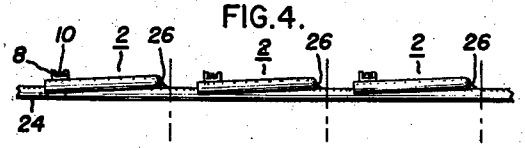


FIG.4.



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GETTER ASSEMBLAGE

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3 Claims. (Cl. 206—56)

This invention relates to the manufacture of electron discharge devices and more particularly to improvements in an assembly or packaging arrangement and method of handling of getters for electron discharge devices.

In the manufacture of electron discharge devices having evacuated envelopes it is common practice to employ getters to absorb gases remaining within the envelope after the envelope is mechanically evacuated and sealed. The getters are customarily manufactured at a location sufficiently removed from the point of assembly of a complete tube as to require shipment to such point of assembly. Such shipments are usually made in bulk packages, which because of the small size, delicate nature and often unusual shape of the getters, are difficult to unpack quickly or without damage to the getters. Moreover getters packaged in this way are inconvenient to handle after unpacking and difficult to orient to the degree desired for automated processing in high speed volume production.

Accordingly it is a principal object of the present invention to provide an improved arrangement for packaging or assembling a plurality of getters such as to facilitate rapid and inexpensive packing in and unpacking from shipping containers, and simplify processing of large numbers of getters at high speed as required for high volume automated production of electron discharge devices.

Another object is to provide a getter assemblage and method of utilizing the same which simplifies processing and assembling of getters in discharge devices.

Another object is to provide an improved getter assemblage of which portions serve additionally as supports for getters installed within completed electron discharge devices.

These and other objects of the invention will be apparent from the following description, and the scope of the invention will be defined in the appended claims.

Briefly in accordance with the present invention, I permanently secure, as by welding, a succession of getters to a continuous elongate metallic carrier, preferably at uniformly spaced points thereon and with a uniform orientation relative to the carrier. The assemblage of carrier mounted getters may then be rapidly and easily packed for shipment, for example by winding the carrier into a coil or roll, with minimum change of damage to the getters. Likewise the assemblage may be conviently and rapidly unpacked and fed into suitable automated processing machinery at the point of electron discharge device assembly with a minimum of hand operations. Each segment of the carrier to which a getter is attached also serves additionally, according to the invention, as the means by which the getter is mounted and supported in an assembled electron discharge device.

In the drawing, Figure 1 is a perspective view of a getter of a type to which the present invention is particularly applicable, processed according to the invention and ready for mounting in an electron discharge device;

Figure 2 is a partially broken away diminished view of an electron discharge device in which the getter of Figure 1 is installed;

Figure 3 is a fragmentary perspective view of a series of getters assembled according to the present invention; and

Figure 4 is a side elevation view of the getters of Figure 3.

Referring to Figure 1 the getter there shown includes a U-shaped holder 2 including a bight portion 4 and spaced arm portions 6. The holder may be a segment of wire, preferably of a metal or metals, such as nickel or copper plated iron, to which it is easy to make a good weld. Extending between and welded to the arms 6 is a trough-like container 8 holding a quantity of a suitable gettering material 10 such as barium. The holder 2 and container 8 together form an electrical inductive loop by which the gettering material may be heated inductively or resistively sufficiently to vaporize the gettering material as desired for gettering action. Permanently attached to the bight portion of holder 2, as by a weld 12, is a metal post 14 by which the getter is supported when mounted within the envelope 16 of an assembled discharge device as shown in Figure 2. The metal post 14 may, as shown in Figure 2, be permanently secured, as by a weld 18, to the top shield 20 or other element of the discharge device.

According to the invention I pre-package a plurality of getters such as shown in Figure 1 into a getter assemblage by mounting a plurality of getters on a common elongate carrier, preferably consisting of a continuous metal wire 24 as shown in Figure 3. The getters are preferable equally spaced and uniformly oriented on the carrier 24, and are permanently secured to the carrier at their bight position, as by welds 26.

Once the getter assemblage is brought to a suitable assembly station, the individual getters may be removed from the carrier 24 by cutting off successive segments of the carrier each having a getter attached to it, as shown in Figure 3. Each carrier segment, already permanently secured to its getter by a weld, can then conveniently and economically serve, after suitable bending or other forming if necessary, as the mounting post 14 for supporting the getter in a discharge device. This eliminates the need for separately fastening the getter to a mounting post before installation in the discharge device.

So that the individual segments of the carrier 24 will be well adapted for mounting within a discharge device envelope, the carrier is preferably made of a metal which both is readily welded and has a minimum capacity for retaining occluded gases such as might be released within the envelope and contaminate the discharge device. Nickel is a particularly suitable metal for the carrier, though other metals, such as copper plated iron for example, are also suitable.

Thus it may be seen that according to the invention large numbers of getters may be conveniently packed for shipment with minimum chance of tangling or injury to the getters merely by winding up the carrier 24 in a coil or reel. Likewise the getters may be conveniently unpacked merely by uncoiling or unreeling the carrier. Also the getters fastened to the common carrier may be conveniently handled or processed through automatic conveying equipment with a minimum of time-consuming and expensive hand operations, and finally the carrier segments themselves serve as the supports for the getters in assembly discharge devices.

It will be appreciated by those skilled in the art that the invention may be carried out in various ways and may take various forms and embodiments other than those illustrative embodiments heretofore described. It is to be understood that the scope of the invention is not

limited by the details of the foregoing description, but will be defined in the following claims.

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

1. A getter assembly comprising a plurality of getters each including a container of gettering material and a U-shaped holder of weldable wire including a bight portion and a pair of arm portions between which the container of gettering material is secured by welds, a continuous elongate carrier of a weldable metal having a low capacity for occluded gases and adapted to be subdivided into segments each of length for a getter mounting post in an electron discharge device, and welds permanently securing the bight portions of said holders to said carrier at uniformly spaced points along said carrier, said holders being arranged in substantially coplanar relation to each other on said carrier.

2. A getter assembly comprising a plurality of getters each including a container of gettering material and a U-shaped holder of weldable wire including a bight portion and a pair of arm portions between which the container of gettering material is secured by welds, a continuous elongate carrier of a weldable metal having a low capacity for occluded gases and adapted to be subdivided into stiff segments each of a length for a getter mounting post in an electron discharge device, and welds securing said carrier segments to said respective holders at a point on each holder spaced from the getter attached thereto, said holders being arranged in substantially coplanar relation to each other on said carrier.

3. A getter assembly comprising a plurality of getters each including a metal container of gettering material and a weldable metal holder, said holder and container together forming a closed electrically conductive loop for inductive heating of said gettering material, a continuous elongate carrier wire of a weldable metal having a low capacity for occluded gases and adapted to be subdivided into stiff segments each of length for a getter mounting post in an electron discharge device, and welds permanently securing said carrier wire segments to said respective holders, said holders being arranged in substantially coplanar relation to each other on said carrier wire.

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