July 22, 1958 J. NIESWAAG ET AL 2,844,761

HIGH VOLTAGE TRANSFORMER

Filed Sept. 26, 1955

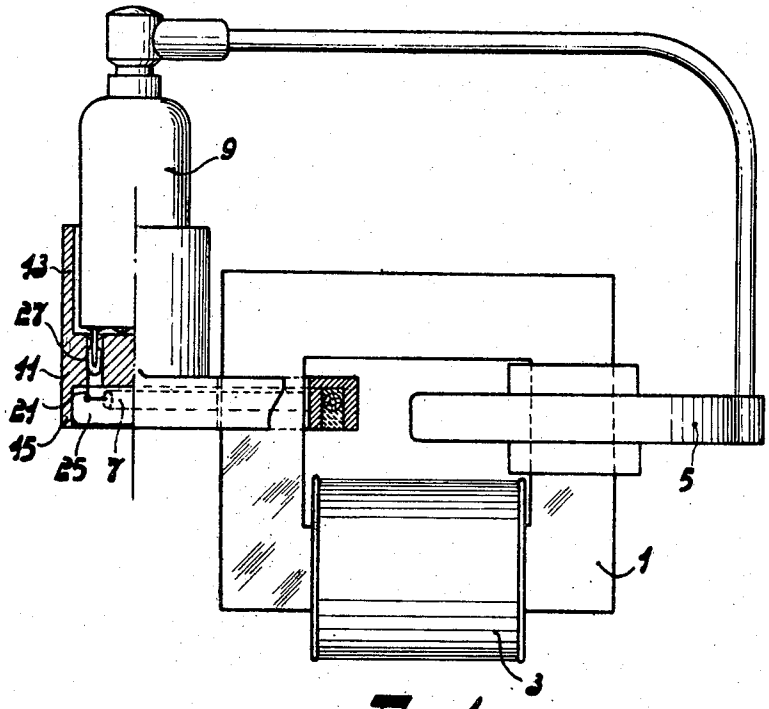


Fig. 1

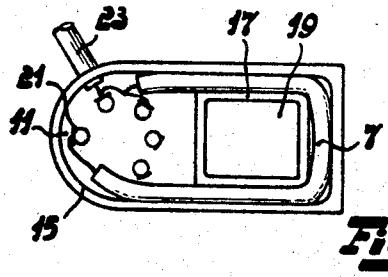


Fig. 2

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United States Patent Office 2,844,761 Patented July 22, 1958

2,844,761

HIGH VOLTAGE TRANSFORMER

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Application September 26, 1955, Serial No. 536,527

Claims priority, application Netherlands October 4, 1954

4 Claims. (Cl. 315—105)

The invention relates to a high-voltage transformer especially useful in television receivers. In particular, it relates to a transformer comprising a holder for a rectifying tube, the cathode of which tube is heated by current supplied from a filament current winding which consists of at least one turn supported from the core of the transformer (cf., for example, French Patent No. 1,021, 348).

Owing to the high voltage of approximately 20 kv. generated in television apparatus, the insulation of the parts to which this high voltage is applied has to satisfy very exacting requirements. Particularly the connections to the rectifying tube may give rise to corona discharge and flashover phenomena. It is well known to enclose the tube entirely in an insulating sleeve from which the supply leads are brought out. However, in this construction replacement of the rectifying tube gives rise to difficulty.

According to the invention, this difficulty is avoided by a construction in which the tube is arranged in a tube holder or support which has a raised insulating rim enclosing the adjacent end of the rectifying tube mounted in that holder. The side of the holder remote from said rim is provided with a lateral extension and a raised insulating edge, which edge together with a second raised edge situated within the first-mentioned edge forms a preferably continuous channel in which at least the greater part of the filament current winding is arranged and which surrounds an aperture of passage for the core. Further all the bare metal parts of the connecting terminals of the tube holder and of the filament current winding connected thereto and of any other wires are embedded in insulating material provided in the said channel.

In order that the invention may readily be carried out, one embodiment thereof will now be described with reference to the accompanying drawings, in which—

Fig. 1 is a side view of the inventive device, and

Fig. 2 is a bottom view of the tube holder.

Fig. 1 shows a high voltage transformer which may form part of a device for generating the line deflection current and the high voltage for the picture tube in a television set. The transformer comprises a ferromagnetic core 1 on which a primary winding 3, a disc-shaped high voltage secondary winding 5 and another secondary, filament current winding 7 are provided. The primary 3 may be connected in a suitable electronic circuit arrangement. Across the winding 5 pulses of a very high voltage, for example of 20 kv., are set up, which are rectified by a diode 9, the filament of which is supplied from the winding 7.

The tube 9 is supported by a tube holder 11, which is shown partly in cross-section in Fig. 1 and in bottom plan view in Fig. 2. The tube holder is made of insulating material, for example polymethacrylate, and at its upper end comprises a raised rim 13, which surrounds a receiving aperture for receiving the adjacent end, in the case shown the bottom end, of the tube 9 and is spaced from

the latter by a comparatively small intermediate spacing. At the lower, opposite end, the tube holder 11 is provided with a lateral extension with a raised edge 15 (Fig. 2). The lateral extension of the tube holder within the edge 15 has a square aperture of passage 19 for the core 1 formed in it, which aperture is surrounded by a raised edge 17. In this way, the holder 11 may be mounted on the transformer core 1. The two edges 15 and 17 and the lateral extension of the tube holder 11 form a preferably continuous channel in which the filament current winding 7—which in the present case comprises a single turn—or at least part thereof is situated. The channel 15, 17 and the tube holder 11 constitute a single insulating moulding; the channel may also serve to secure the moulding to the core 1, for example, by means of glue or cement provided along the edges of the aperture 19.

The bare metal parts, i. e. the parts not enclosed by insulating material, of the terminals 21 of the tube holder 11, of the winding 7 and of any further connections to the terminals 21 such as, for example, the supply wire 23, are embedded in insulating material 25, for example in a suitable synthetic resin, in a manner such that at no point non-insulated parts are brought out from the moulding mass 25 (Fig. 1). The winding 7, which is completely enclosed, may in addition be provided with an insulating sheath of polyethylene; this is necessary when the winding is not embedded throughout its length.

As will be seen from Fig. 1, the contact pins 27 of the tube 9 communicate with the ambient atmosphere only by way of the annular channel between the rim 13 and the tube 9. However, this channel is comparatively long and narrow and the resistance it offers to ionisation by the high voltage is such as to substantially prevent flashover phenomena. On the other hand, at the bottom all the bare metal parts are embedded so that there also no contact with the ambient atmosphere is provided which may give rise to flash-over. This result is obtained by means of the described device without adversely affecting easy replacement of the tube.

What is claimed is:

1. In combination, a transformer having a ferromagnetic core and wound on said core a primary winding and a secondary winding adapted to supply heating current for the cathode of a discharge tube, and means for receiving and supporting said discharge tube in an operating position, said tube supporting means being mounted on said ferromagnetic core and comprising two portions, one of said portions substantially enclosing said secondary winding, the other of said portions being adapted to receive said discharge tube.

2. In combination, a transformer having a ferromagnetic core and wound on said core a primary winding, a first secondary winding adapted to supply heating current to the cathode of a discharge tube, and a second secondary winding adapted to supply a high voltage for the anode of said discharge tube, and means for receiving and supporting said discharge tube in an operating position, said tube supporting means comprising a first portion surrounding and secured to said ferromagnetic core and substantially enclosing a portion of said first secondary winding, said tube supporting means including a second portion having for said discharge tube at one end a receiving aperture surrounded by insulating material and at the opposite end an insulating portion integral with said first portion and substantially enclosing the remainder of said first secondary winding.

3. The combination of claim 2 wherein the opposite end of the second portion and the first portion of the tube supporting means cooperate to establish a substantially continuous channel surrounded by insulating material

and in which is secured the first secondary winding, said channel surrounding the ferromagnetic core.

4. The combination of claim 3 wherein insulating material is provided in the said channel covering the first secondary winding and in the opposite end of said second portion and covering all uninsulated conductive members therein.

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