

The invention relates to a high-voltage generator according to the preamble of claim 1.

It is known that the anode of a television picture tube forms with its coating disposed inside the glass bulb, in combination with a shielding metallization applied to the outside of the glass bulb and connected to frame, a capacitor of the order of magnitude of approx. 2 000 pF. The dielectric for this capacitor consists of the glass of the glass bulb of the picture tube. If a d.c. anode voltage of several kV is applied, the capacitor is charged and, because of the high quality of the dielectric provided, maintains this voltage for a long time when the set is switched off. This high voltage stored when the set is switched off is undesirable, because on the one hand it can cause an undesirable flickering of the picture tube after the switching-off, and on the other it represents a source of danger in the event of any repairs and also promotes dust deposits e.g. through the ionisation of dust particles in the vicinity of the anode terminal.

In order to reduce this stored voltage in the switched-off state, the connection between anode and frame of a high ohmic resistor, also known as a bleeder, is known, which is designed so that the high voltage is not significantly affected by the flow in the bleeder, but rather that this voltage is reduced during a pre-determined period. This resistor has on insulation grounds to be fixed in the set with special design means.

For example, a design in which the bleeder is combined with the high-voltage connector, i.e. with the anode terminal of the picture tube, is known. The leakage resistor is in this case soldered into a conduit bushing between the high-voltage cable and the high-voltage connector. The connection to frame via a potentiometer of the end of the leakage resistor facing away from the high-voltage terminal and the picking-off from this potentiometer of the focussing voltage for the picture tube is also known.

For the installing of such an assembly in a colour television receiver, several comparatively long connecting leads are required, since the high-voltage rectifier supplying the high voltage is generally arranged on the receiver chassis, the high voltage having to be fed to a terminal in the cone-shaped region of the picture tube and the focussing voltage near to the picture tube base.

The invention is based on the task of reducing the design effort involved in the layout and contacting of the components connected with the high voltage. This task is solved by the invention described in the independent claim 1. Advantageous developments of the invention are described in the dependent claims.

The invention consists in principle in the fact that if two small electrically conductive rubber parts are used, the bleeder, merely by means of the clamping action of the rubber parts without additional fixing means, can be arranged in an inner compartment of the cap made of insulating plastics

material of the line transformer generating the high voltage. This takes place by the bleeder with its terminal contacts being inserted between the insulating cap wall and the rubber parts firmly disposed in recesses of the cap. By means of this solution the terminal contacts of the bleeder are connected by clamping action with the two rubber parts, which are preferably cylindrical in shape. The two cylindrically-shaped rubber parts are so disposed inside the cap that on the mounting of the cap on the pre-fitted line transformer, aligned wire ends on the transformer are inserted into the rubber parts, whereby bleeder and transformer terminals are brought into contact with one another without soldering.

Guide tubes are also attached to the outside of the cap, which are designed so that high-voltage-proof cables can be inserted into these tubes both for the anode terminal and for the focussing terminal of the picture tube, with the bared part, i.e. the inner conductor of the cable, being guided so that the latter penetrates into the conductive rubber parts, whereby electrical contact between high-voltage winding and high-voltage cable takes place, likewise without soldering.

It is advantageous if the high-voltage rectifier diode is likewise disposed inside the insulating cap, with the d.c.-side connecting lead of the diode penetrating into the conductive rubber as an aligned wire end during the fitting of the cap. In this way all the high-voltage-conducting parts can be accommodated inside the insulating cap of the line transformer and thus form a high-voltage unit.

In a preferred form of the invention the bleeder is connected electrically between the high-voltage terminal and a separate tap of the high-voltage winding for the focussing voltage. This ensures that the bleeder in conjunction with the focussing potentiometer is used exclusively for the leakage of the high voltage when the set is switched off and that the function as divider resistance for the generation of the focussing voltage is not exploited. The resistance value of the bleeder can for this reason be increased from e.g. 170 Mohm to 400 Mohm - 1 000 Mohm, whereby the time for the reduction of the stored voltage admittedly increases, but on the other hand the discharge current is reduced. It is also possible to use a resistance which is designed for a far smaller output. In this way the heat generated inside the insulating cap is also reduced.

The invention will be explained by means of the drawings for an exemplifying embodiment, in which

Figs 1 and 2 show in transverse sections the components disposed inside the compartment of the insulating cap, Fig. 3 shows a simplified circuit for the high voltage generation.

Figures 1 and 2 show in transverse sections part of an insulating cap 3 surrounding the non-represented line transformer, i.e. the compartment in which the leakage resistor or bleeder 2 is disposed. The bleeder 2 in this exemplifying embodiment has a flat rectangular shape. The

resistance coat is applied in a meander shape to an insulating base plate, at the ends of which the metallized contact terminals extend in sheet-like form. As can be clearly distinguished in Fig. 2, the bleeder 2 is clamped between recesses in the insulating cap 3 by means of the rubber parts 1 disposed in these recesses. By means of the resilient action of the electrically conductive rubber parts the bleeder is fixed in its position, whereby in addition good contact transfer from the contact surfaces of the bleeder to the rubber parts is ensured. The cylindrically-shaped rubber parts have a diameter of about 4 mm with a length of about 10 mm.

If the insulating cap with inserted bleeder is pushed onto the more or less fully mounted line transformer, aligned wire ends 6, 7 connected firmly to the line transformer and consisting e.g. of the connecting leads of diodes or resistors penetrate into the cylindrically-shaped conductive rubber parts and thus produce a good electrical connection between the windings of the line transformer and the terminal ends of the bleeder.

If the line transformer is mounted in a television set, the connections to the anode terminal and the focussing terminal of the picture tube have to be made. This takes place by the insertion of already bared high-voltage cables 4 and 5 into the tube-shaped terminal guides of the insulating cap 3. The bared portion of the inner conductors is of a fixed predetermined length, so that the inner conductors of these cables penetrate into the conductive rubber, as shown in Fig. 2, and the high-voltage-conducting picture tube electrodes thereby make contact with the voltage sources.

Fig. 3 shows in simplified form a circuit for high-voltage generators, which in this example is part of a line sweep circuit in a television receiver, with an output transistor 8, the primary winding 9 of a line transformer 17, with two series-connected secondary high-voltage windings 10 and 11, the high-voltage rectifiers 12 and 13, the bleeder 2 and a voltage-divider circuit for the focussing voltage, consisting of the resistors 14, focussing potentiometer 15 and resistor 16. The connecting lead 6 of diode 13 and the connecting lead 7 of resistor 14 correspond to the lines 6 and 7 contacting with the live rubber parts 1 by means of a connector pair in Figs 1 and 2. The line 4 produces the high-voltage connection to the anode of a non-represented picture tube and is also, like the line 5 leading to the focussing potentiometer 15, connected by connector pair to the conductive rubber parts 1 which simultaneously also contact the bleeder 2, as is seen from Figs 1 and 2.

The transistor 8 is controlled by a switching voltage U in time with the line frequency pulses. In the series circuit of the secondary windings 10 and 11 a high voltage is induced which is rectified by means of the two diodes 12 and 13 and fed via line 4 to the anode of the picture tube. In order that the capacitor C formed by the anode coating and the external frame-connected shielding of the picture tube discharges after the switching-off of the set, the bleeder 2 is switched on. In order to accommodate the bleeder 2 in a compartment of the housing of

line transformer 16, the electric circuit has been designed so that the focussing voltage is derived from a tap of the high-voltage winding. In this way the bleeder does not act as a series resistance for generating the focussing voltage and in view of the low heat produced can be given an extremely high resistance rating, e.g. 400 - 1 000 Mohm. The frame-side connection of the bleeder takes place via the focussing controller 15 and resistor 16.

C l a i m s

1. High-voltage generator, in particular line transformer with high-voltage generation for a TV set, in which the high-voltage terminals (6, 7) are brought into contact with the outgoing leads (4, 5) via electrically conductive rubber parts (1) and are connected to a leakage resistor (2) for the high voltage, characterised in that the leakage resistor (2) is disposed in a compartment of the plastics cap (3) of the high-voltage generator with its terminal contacts butting closely against the rubber parts (1) so that an electrical contact is guaranteed.
2. High-voltage generator according to Claim 1, characterised in that on mounting of the insulating cap (3) provided with leakage resistor and rubber parts, prepared wire ends (6, 7) connected to the high voltage penetrate into the rubber parts (1).
3. High-voltage generator according to Claim 2, characterised in that the prepared wire ends (6, 7) are formed from the terminal pins of diode rectifiers and/or resistors.
4. High-voltage generator according to Claim 1, characterised in that guide tubes for the connection of high-voltage cables (4, 5) are attached to the compartment of the insulating cap (3).
5. High-voltage generator according to Claim 1, characterised in that the conductive rubber parts (1) are cylindrical in shape.
6. High-voltage generator according to Claims 1 and 5, characterised in that the cylindrical rubber parts (1) are so disposed in the compartment that a wire end from the high-voltage generator can be inserted into one surface of the cylinder and the inner conductor of a high-voltage cable can be inserted into the other surface.

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