A picture tube in which a layer of synthetic resin in the form of an adhesive tape reinforced with a fabric is provided between a clamping band and the envelope. The reinforcement is in contact both with the glass envelope and with the band to increase friction therebetween.

3 Claims, 2 Drawing Figures
IMPLOSION-FREE PICTURE TUBE

This is a division of application Ser. No. 214,788, filed Jan. 3, 1972, now U.S. Pat. No. 3,818,557, issued June 25, 1974.

The invention relates to a method of manufacturing an implosion-free picture tube for television display in which after evacuation of the tube the widest part of the tube is first covered with a layer of adhesive across which a clamping band is provided. The invention furthermore relates to a picture tube manufactured by said method.

It is known for example, from the U.S. Pat. No. 2,785,820 to first cover a part of an envelope of a picture tube with a layer of adhesive and to provide a clamping band around said layer before said layer has hardened. The drawback is that the still soft adhesive is forced aside by the clamping band so that the band can locally touch the glass wall. Moreover the possibility exists that the soft adhesive acts as a lubricant so that the clamping band can slide off the envelope before the adhesive has hardened.

From the Dutch Patent Application No. 6805299 it is furthermore known to shrink a heated clamping band around an envelope which is covered with a non-hardened layer of synthetic resin, the thermal energy of the band effecting the hardening of synthetic resin. In order to prevent the sliding off of the band from the envelope and to improve the adhesion of the layer of synthetic resin to the band and envelope, the band is roughened on the inside and the envelope is roughened on the outside. Moreover, any space present between the band and the envelope must afterwards be filled with a synthetic resin in order to avoid the danger of the clamping band sliding off the envelope afterwards and to obtain a reliable anti-implosion effect. Roughening of the band and the envelope and the refilling, however, is complicated and hence expensive.

It is also known from German Utility Model No. 1,853,691 to provide an adhesive tape around an envelope and to clamp around it a band for connection of the tube in a cabinet. However, this embodiment could not provide any freedom from implosion, since the clamping band had not been provided for this purpose.

It has been found that the said drawbacks can be avoided in a simple manner in a method of manufacturing an implosion-free picture tube for television display in which after the tube is evacuated, the widest part of the envelope of the tube is first covered with a reinforced adhesive tape onto which a clamping band is arranged. An adhesive tape reinforced with a fabric, for example glass fabric or metal fabric, is preferably used.

The advantage of a reinforced layer of adhesive tape is that any space between the clamping band and the layer of adhesive tape, for example a gap between the edge of the clamping band facing the cone and the layer of adhesive tape, need not be filled since the adhesive tape which is preferably reinforced with a fabric readily adheres to the envelope due to its adhesive force, forms a girdle around the envelope and thereby itself slightly acts as an anti-implosion band. In the case of an implosion, the splintered glass of the envelope is also held by the strong adhesive action of the adhesive tape.

The fabric increases the friction between the clamping band and the envelope to such an extent that roughening of the band or of the glass of the envelope is no longer necessary to prevent the sliding off of the clamping band from the envelope.

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

FIG. 1 is a cross-sectional view of a part of a tube provided with a clamping band and an adhesive layer while:

FIG. 2 is a cross-sectional view of a clamping band reinforced with fabric.

Referring now to FIG. 1, reference numeral 1 denotes the glass wall of the widest part of an envelope of a picture tube. Reference numeral 2 denotes the window on the inside of which a phosphor screen 3 is provided.

An adhesive tape 5 reinforced, for example, with glass fabric 4 and consisting, for example, of a suitable synthetic resin, for example an epoxy resin, is adhered to the wall 1. Although only one layer of adhesive tape is shown, the tape may also be wound more than once around the envelope.

A clamping band 6 is provided on the adhesive tape 5. The adhesive tape 5 preferably consists of a not yet hardened synthetic resin and the clamping band 6 is provided around the layer of adhesive tape, preferably in the hot condition preferably within the temperature range of 400° to 450° centigrade. The synthetic resin will partly melt and harden before the clamping band has cooled. As a result of the softening of the synthetic resin, the fabric 4 is clamped between the clamping band 6 and the glass wall 1 and prevents the sliding off of the clamping band 6 as a result of the large friction.

Roughening of the band 6 or of the glass wall 1 therefore is not necessary. Instead of the hardening synthetic resin, the adhesive tape may also consist of non-hardening materials in which the problem of the sliding off is even larger since the material is still soft when the clamping band has cooled to such a temperature that a large pressure is already exerted on the wall of the tube.

Filling of the gap 7 is not necessary either since the layer of adhesive tape itself acts slightly as an anti-implosion girdle. The said operations, namely the roughening of the band 6 and of the surface of the glass wall 1 and filling up of the gap 7, may thus be omitted which involves a considerable reduction of the cost of manufacture.

The method according to the invention may be used in combination with substantially any known embodiment of clamping bands, if desirable also in combination with the use of a known layer on the cone of the tube which layer is reinforced by glass fibres. Instead of a single clamping band, several clamping bands may be provided on or beside each other and, if desirable, an intermediate band may be used. Furthermore, the clamping band or an intermediate band may be wide so that it adjoins the surface 2 of the window.

Although a black-and-white picture tube is shown, the invention may also be applied to colour display tubes.

The reinforcement embedded in the adhesive tape need not consist of glass fabric but may also consist of another suitable material, a suitable metal or a suitable metal alloy. Furthermore, a coarse-mesh fabric or an apertured plate may be used as a reinforcement, or even one or more layers of parallel wires laid one on
top of the other may be used in which the wires of the various layers intersect each other, if desirable, at an angle.

In this case, however, a number of wires must always be present which extend substantially in the longitudinal direction of the adhesive tape so as to obtain a sufficient reinforcement of the adhesive tape.

Actually, when using short fibres the band should be given an undesirably large thickness or the gap would have to be filled.

What is claimed is:

1. An implosion protected picture tube having a glass envelope including a screen and a funnel-like wall, comprising: an adhesive tape surrounding a peripheral portion of said wall, a metal clamping band tightly surrounding said tape, and a reinforcement fabric embedded within said tape and including a plurality of parallel fibres extending substantially in the longitudinal direction of the tape, said fibres contacting both the envelope and metal band to increase friction therebetween.

2. A picture tube according to claim 1 wherein said fabric is of glass.

3. A picture tube according to claim 1 wherein said fabric is of metal.

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