

Device for Placing and Fixing the Static Convergence
Correction Unit on the Neck of a Colour Television Tube

Description

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The subject of the present invention is a device for placing and fixing the static convergence correction unit on the neck of a colour television tube.

10 It is known that colour television tubes use, mounted at the rear of the tube in a region called the "neck", three guns projecting three electron beams, each corresponding to one of the three colours, namely blue, green or red, of the phosphors or luminophors of corresponding colour struck by the electrons projected by their respective guns. On the
15 other hand, mounted in the path of these beams at the rear of the tube, at a short distance from the guns, is the deflection block which controls the beam scans to form the image. However, the first adjustment necessary is for the three beams, when no deflection is imparted to them, to be made to
20 strike the centre of the screen slab of the tube. This adjustment is made in a conventional way by the static convergence correction unit which consists of several small magnets, of which the magnetic fields interfering with one another make it possible to carry out the desired adjustment. This cor-
25 rection unit is usually placed just behind the deflection block of the tube. Its placing on the tube, its exact positioning and the adjustment and maintenance operations associated with it present difficult problems which the invention makes it possible to solve simply and economically.

30 According to the known prior art, the static convergence correction unit could comprise various adjustable unitary elements which were fixed, for example adhesively bonded, behind the deflection block of the tube. Such a process is long, difficult to carry out on an industrial scale
35 and does not make it possible to carry out adjustments in a flexible way.

According to another process of the prior art, a

ring usually consisting of a plastic reinforced with ferrite is placed behind the deflection block and can be magnetized in the most appropriate way to obtain the desired static convergence corrections. This ring can be split, and in
5 this case it is fixed to the neck of the tube by clamping by means of an outer metal collar. The adjustment operations are not very easy because the ring cannot be magnetized with the metal fixing collar in place. On the other hand, the fact that the ring is split also introduces an air-gap un-
10 favourable for a good adjustment.

According to another known technique, the ring made of plastic reinforced with ferrite is not split, thus eliminating the problem of the air-gap. On the other hand, this introduces a problem which is difficult to solve, in-
15 volving the exact positioning of this ring on the neck of the tube, in view of the production tolerances in particular of the glass of the tube and the relatively large and variable play present between the walls of the neck of the tube and of the static convergence correction unit. This axial
20 play is unfavourable in terms of both carrying out the adjustment and fixing the ring to the neck of the tube.

According to another state of the art, it is known to interpose between the static convergence correction unit and the neck of the tube a notched fixing element adhes-
25 ively bonded to the neck or fastened by an additional means.

The patent BE-A-528,230, where the neck of the tube has two annular protuberances, on which a bush carrying the focussing magnet slides, may be mentioned. The patent
FR-A-2,306,522, where the correction ring has an annular
30 support made of a synthetic material, on the outside of which the correcting magnet is arranged, may also be mentioned.

To overcome the disadvantages of the prior art, the present invention relates to a device for placing and fix-
35 ing the static convergence correction unit on the neck of a colour television tube, of the type comprising an interposed body between the neck of the tube and the said static

convergence correction unit, the said correction unit being essentially composed of a closed cylindrical ring made of plastic reinforced with ferrite, the said ring having an internal diameter D_3 slightly greater than the external diameter D_2 of the neck 1 of the tube which it is to equip, characterized in that it possesses at least one and preferably two elastic collars 7,8 made of a heat-resistant elastomeric material, such as a silicone rubber, which are arranged stretched round the neck of the tube and have a cross-section of reduced thickness, that is to say approximately one to two mm, the said elastic collar or elastic collars being compressed by the wall of the said unit positioned on the neck over the said collar or collars.

It can be understood that the placing of the correction unit is made considerably easier in this way. Moreover, it is no longer necessary to use any additional component to fix the correction unit to the neck of the tube after it has been put into place.

According to another characteristic of the invention, the desired magnetization of the static convergence correction unit is carried out when the latter is in place on the neck of the tube, thus facilitating the operation and making it easy to carry out on an industrial scale.

The device according to the invention comprises a static convergence correction unit essentially composed of a closed plastic cylindrical ring reinforced with ferrite and having a lower (sic) diameter slightly greater than the external diameter of the neck of the tube which it is to equip, at least one and preferably two elastic collars made of a heat-resistant elastomeric material, such as silicone rubber, having, in a state of rest, a diameter less than the outside diameter of the neck and a cross-section of reduced thickness of approximately one to two millimetres, the said device, in the position fitted on the tube, having the said unit positioned on the neck over the said elastic collars compressed between the mutually opposite walls of the said unit and of the said neck.

The invention will emerge more clearly with the help of the following detailed description made with reference to the accompanying drawings which illustrate an exemplary embodiment and in which:

5 Figure 1 shows a diagrammatic cutaway elevation view of the rear part of a television tube on which the device of the invention is placed,

 Figure 2 is a view, similar to that of Figure 1, showing the stage of final positioning of the device,

10 Figure 3 shows the device, as equipped in Figure 2 and having received an additional correction member,

 Figures 4 and 5 show respectively perspective views of the ring forming the static convergence correction unit and the elastic positioning collars used according to the
15 invention,

 Figure 6 is a view on a larger scale of the detail surrounded at VI in Figure 2.

 Referring first of all to Figure 1, this shows the rear part or neck 1 of a colour television tube 2, on which
20 has just been mounted in any known way the deflection block 5, the outer contour of which has been represented by broken lines in the Figure and of which Figures 2 and 3 show only the rear face 4, against which the static convergence correction unit is mounted slightly in front of the guns (not
25 shown) located inside the neck at the rear end of the latter. In Figure 1, the letters AR mark the rearward direction in relation to the forward direction, marked AV, of the tube of which the axis has been marked 5.

 According to the invention, the static convergence
30 correction unit used is a closed cylindrical ring 6 known per se, which can be seen in particular in Figures 2 and 4. This ring advantageously consists of a plastic of suitable quality reinforced with ferrite, such that it is possible to produce there the polar magnetic elements desired to obtain
35 the desired magnetic static convergence correction.

 The problem which arose according to the prior art with the use of such a ring was that, in view of the

production tolerances in particular of the neck 1 of the glass tube 2, a relatively large play had to be provided, variable from one tube to another, between the inner wall of a ring 6 and the outer wall of the neck 1, and good
5 fixing of the ring could not be achieved.

In contrast to this, according to the invention, this play is utilized in the way which will now be explained.

Two elastic hoops or collars made of a rubber of
10 suitable quality and marked respectively 7 and 8 are engaged on the neck 1 behind the deflection block 3. The dimensions of these hoops are such that their diameter D_1 (Figure 5) is, in a state of rest, clearly less than the external diameter D_2 of a tube neck. For example, if the
15 neck has a diameter D_2 of the order of 29 millimetres, the diameter D_1 of the collars 7 and 8 can be of the order of 13 to 26 millimetres. The collars 7 and 8 are thus positioned on the neck 1 stretched and remain in place by themselves.

20 Subsequently, the ring 6 which forms the static convergence correction unit and the internal diameter D_3 of which is slightly greater than the diameter D_2 , for example of the order of 30 millimetres, is slipped over the neck 1 of the tube and over the two collars 7, 8. If care
25 has been taken to select a sufficient thickness d of the cross-section of the collars 7, 8, for example of the order of 1 to 2 millimetres, it can be understood that, as emerges more clearly from Figures 2 and 6, the positioning of the ring 6 on the neck 1 over the collars 7 and 8 can be
30 obtained only with some compression of the cross-section of the collars 7 and 8, there-by at the same time ensuring the perfect positioning, both axial and diametral, of the ring 6 on the collar 1. In the given example where the mean diameter D_2 of the neck 1 of the tube is 29 millimetres a
35 mean internal diameter of the ring 6 of 30 millimetres can be selected, this providing a mean diametral play of 1 millimetre, making it possible to absorb normal production

tolerances. Under such conditions, a thickness d of the cross-section of the collars of the order of 1.5 to 2 millimetres will advantageously be selected, so as to obtain a sufficient compression of these collars during the placing
5 of the static convergence correction unit 6. It will be noted that, if the production tolerances for the tubes are higher than one millimetre for the value of the diameter of the neck, a set of several correction rings 6 having diameters stepped can be provided, and the ring of the
10 most suitable size, that is to say of the diameter D_3 which is the smallest, but greater than the diameter D_2 of the tube, will be fitted on the neck of the tube each time. Under these conditions, the collars 7, 8 can be standard collars.

15 Given that this part of the neck of the tube is relatively hot when the tube is in operation, the collars 7, 8 will advantageously consist of an elastomeric material with silicones which, for example, can have the following characteristics:

20 hardness: 50 degrees Shore,
 elongation at break: 400%

By way of an example, mention will be made that the normal thickness of the ring 6 can be of the order of 1.5 millimetres or more, whereas the axial length L of the ring
25 varies as a function of the type of tube equipped.

Advantageously, the placing of the ring 6 on the neck 1 of the tube is carried out, as illustrated in Figure 2, before the magnetization of this ring. Once it is in place, the three electron beams are then centred in a magnetizing
30 machine conventional in the art, and when correct centring is obtained the ring 6 is magnetized accordingly, generating the polar masses there at the desired locations.

The static convergence correction is thus made permanently, and there is no longer any need to carry out any subsequent
35 operation of fixing the ring 6.

An additional advantage of the invention, as illustrated in Figure 3, arises in that, if appropriate, it is

possible to fit over the ring 6 an additional correction ring 9 which can be fixed in a conventional way round this ring in the manner of a non-magnetic clamping collar. The ring 9 can, for example, carry small correcting magnets.

5 Amongst the advantages obtained according to the invention, the following in particular may be noted:

- a) Since the ring 6 is closed and cylindrical, there is no air-gap harmful to the effective operation of the device;
- b) The ring 6 can be produced extremely economically according to very simple production standards; if appropriate several ring diameters can be provided;
- 10 c) The magnetizing coils of the machine, or magnetizing the ring will always be at a specific distance from the ring 6, thus resulting in a perfect constancy of the magnetizing actions, making perfect magnetic balancing possible;
- 15 d) The distance between the magnetizing coils of the magnetizing machine and the ring 6 can be reduced, thus increasing the efficiency of the machine;
- e) Additional correcting devices can be applied over the static convergence correction ring mounted according to the invention;
- 20 f) The device is economical in terms of production and maintenance, and if appropriate the ring can be removed and re-used.

25 As regards the structure of the collars or hoops 7, 8, it will be noted that these collars can have a circular cross-section, as illustrated. If appropriate, they can be given an elliptic or even rectangular or square cross-section, even though the provision of cross-sections with a rounded angle will generally make it easier to carry out the introduction and good placing of the ring 6 over the collars.

30 Preferably, two collars will be used, these being located at a distance from one another slightly less than the length L of the ring 6, making it possible to obtain perfect results.

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Claims

1. Device for placing and fixing the static convergence correction unit on the neck of a colour television tube, of the type comprising an interposed body between the neck of the tube and the said static convergence correction unit, the said correction unit being essentially composed of a closed cylindrical ring (6) made of a plastic reinforced with ferrite, the said ring having an internal diameter (D_3) slightly greater than the external diameter (D_2) of the neck (1) of the tube which it is to equip, characterized in that it comprises at least one and preferably two elastic collars (7, 8) made of a heat-resistant elastomeric material, such as a silicone rubber, which are arranged stretched around the neck of the tube and which have a cross-section of reduced thickness, that is to say approximately one to two millimetres the said elastic collar or elastic collars being compressed by the wall of the said unit positioned on the neck over the said collar or collars.

2. Device according to Claim 1, characterized in that it comprises two collars (7, 8) placed at the desired location of the neck (1) and spaced from one another at a distance slightly less than the length L of the said ring (6), measured in the direction of its axis.

3. Device according to one of Claims 1 or 2, characterized in that the said ring (6) is capable of being magnetized when it is in place on the neck (1) of the tube.

4. Device according to Claim 1, characterized in that the said collars have a substantially circular rounded cross-section.

5. Device according to Claim 1, characterized in that the said collars have a substantially elliptical rounded cross-section.

6. Device according to Claim 1, characterized in that the said collars have a substantial rectangular or square cross-section.





As printed

Claims

1. Device for placing and fixing the static convergence correction unit on the neck of a color television tube, of the type comprising an interposed body between the neck of the tube and said static convergence correction unit, said correction unit being essentially composed of a closed cylindrical ring (6) of plastics material loaded with ferrit, said ring having an inner diameter (D_1) slightly exceeding the outer diameter (D_2) of the neck (1) of the tube to be equipped therewith, characterized in that it comprises at least one and preferentially two resilient collars (7, 8) of heat-resistant elastomer material such as silicone rubber which are stretched around the tube neck and have a section of a small thickness, i. e. about 1 to 2 mm, said resilient collar(s) being compressed by the wall of said unit positioned on the neck over said collar(s).

2. Device according to claim 1, characterized in that it comprises two collars (7, 8) arranged at the desired position of the neck (1) and spaced from each other by a distance which is slightly smaller than the length (L) of said ring (6) measured in the direction of its axis.

3. Device according to any of claims and 2, characterized in that said ring (6) is susceptible to be magnetized when it is placed on the neck (1) of the tube.

4. Device according to claim 1, characterized

in that said collars have a substantially circularly rounded section.

5. Device according to claim 1, characterized in that said collars have a substantially elliptically rounded section.

6. Device according to claim 1, characterized in that said collars have a substantially rectangular or square section.

Patentansprüche

1. Vorrichtung zum Einbauen und zur Befestigung der statischen Konvergenzkorrekturereinheit am Hals einer Farbfernsehröhre, vom Typ mit einem Zwischenstück zwischen dem Hals der Röhre und der genannten statischen Konvergenzkorrekturereinheit, wobei diese Korrekturereinheit im wesentlichen zusammengesetzt ist aus einem zylindrischen geschlossenen Ring (6) aus Plastikmaterial, das mit Ferrit befrachtet ist, wobei der genannte Ring einen Innendurchmesser (D_1) aufweist, der etwas größer als der Außendurchmesser (D_2) des Halses (1) der damit auszustattenden Röhre ist, dadurch gekennzeichnet, daß sie wenigstens ein und vorzugsweise zwei elastische Halsbänder (7, 8) aus hitzebeständigem Elastomermaterial wie ein Silikonkautschuk umfaßt, die unter Dehnung um den Röhrenhals aufgezogen sind und einen Quer-

schnitt von verminderter Dicke, d. h. von etwa 1 bis 2 mm aufweisen, wobei das genannte elastische Halsband bzw. diese Halsbänder durch die Wandung der genannten Einheit zusammengedrückt sind, die auf den Hals über die genannten Halsbänder aufgesetzt ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß sie zwei Halsbänder (7, 8) umfaßt, die an der gewünschten Stelle des Halses (1) in einem Abstand voneinander angeordnet sind, der etwas kleiner ist als die in Richtung der Achse des genannten Ringes (6) gemessene Länge desselben.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der genannte Ring (6) magnetisierbar ist, wenn er auf den Hals (1) der Röhre aufgesetzt ist.

4. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die genannten Halsbänder einen im wesentlichen kreisrund abgerundeten Querschnitt aufweisen.

5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die genannten Halsbänder einen im wesentlichen elliptisch abgerundeten Querschnitt aufweisen.

6. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die genannten Halsbänder einen im wesentlichen rechtwinkligen oder quadratischen Querschnitt aufweisen.