

Description

The present invention relates to a television receiver (TV set) including a cathode ray tube and, more particularly, to a structure for attaching the cathode ray tube to a cabinet of the television receiver.

In recent years, there has been an increased demand for large-sized colour television receivers, and big receivers each having a display plane of 45 inches are manufactured and available. In such big receivers, a large cathode ray tube has to be directly secured to a cabinet of the receiver. A typical conventional structure of securing a cathode ray tube is shown in Fig. 5. Fig. 5 shows a vertical cross-sectional view of a top portion of a television receiver provided with a cathode ray tube. In the drawing, a cabinet 3 includes a window A corresponding to a face (image display plane) 1a of a cathode ray tube 1. A boss 4 is integrally formed on an inner side of a portion of the cabinet surrounding the window A, i.e., a portion of the cabinet in contact with a peripheral edge portion of the face, and more briefly, a window frame 3a. The boss 4 projects from the inner side of the window frame 3a. At least three bosses of the same kind as the boss 4 are also provided at three other portions of the window frame 3a. A metallic fixture bracket 2 of the cathode ray tube 1 is fixed to a distal end of the boss 4 through a dimensional compensating member 6 and fixed thereto by means of a screw fastener 5. Another dimensional compensating member 7 is interposed between the window frame 3a and the cathode ray tube 1. In such a structure, a mutual positional relationship between the window frame 3a of the cabinet, the boss 4, the cathode ray tube 1 and the bracket 2 including the structure attaching the fixture metal piece 2 to the cathode ray tube 1, may be variable. Thus, when the cathode ray tube 1 is secured to the cabinet 3, it is necessary to utilise the separate dimensional compensating members 6 and 7 in the manner as shown in Fig. 5.

French patent specification FR-A-1 082 031 shows a television receiver including a cabinet having a window and front window frames which surrounds said window, wherein a portion of each window frame is formed to be elastically deformable outwardly due to contact between the cathode ray tube and the cabinet when assembling them, and a variation in a dimensional relationship between the cabinets and the cathode ray tube caused when positioning the cathode ray tube in the cabinet is compensated for by the elastic deformation of the portions of the window frames.

This television receiver also employs a separate member to compensate for a variation in the positional deviation of the cathode ray tube and cabinet.

In the above-described structures which employ at least one separate dimensional compensating member, it is hard to automatically assemble the re-

ceiver by a production machine.

United States patent specification No. 4 360 838 provides a television receiver in which the window frames surrounding the window have elastically deformable lips for accommodating a variation in diameter of cathode ray tubes.

A primary object of the invention is to facilitate accommodation of a cathode ray tube into a cabinet of a television receiver and in so doing to compensate for any variation in dimensional relationship between them.

In order to attain this object, the invention does not employ a separate dimensional compensating member interposed between the cabinet and the cathode ray tube.

According to a primary aspect of the present invention there is provided a television receiver including a cabinet having a window and front window frames which surrounds said window, wherein a portion of each window frame is formed to be elastically deformable outwardly due to contact between the cathode ray tube and the cabinet when assembling them, and a variation in a dimensional relationship between the cabinet and the cathode ray tube caused when positioning the cathode ray tube in the cabinet is compensated for by the elastic deformation of the portions of the window frames, characterised in that said window frames are an integral part of the wall portions of the cabinet.

One method of enabling the front window frames of the cabinet to be elastically deformable is to reduce the thickness of each of the front window frames from its proximal end portion in communication with a wall of the cabinet towards its free end.

It is also an effective means to provide a dimensional compensating member on the cabinet at a position where the front window frame is in contact with the cathode ray tube by integrally moulding the dimensional compensating member with the cabinet body, the member being formed from a rubber type elastomer resin or the like, for example, which is softer than the cabinet body which is formed from a material of styrol plastic or the like. The integral moulding (or insert moulding) can be readily performed by positioning a dimensional compensating member in a mould cavity when the cabinet is manufactured from resin by an injection-moulding process.

Other features of the invention will become more apparent from the following description with reference to the accompanying drawings, of which:-

Fig. 1 is a fragmentary perspective view showing one embodiment of a television receiver according to the invention, as viewed from a back side thereof, illustrative of a state before a cathode ray tube is secured to a cabinet;

Fig. 2 is a vertical cross-sectional side view of a top portion of the television receiver, showing a state in which the cathode ray tube is secured to

the cabinet and a front window frame of the cabinet is not deformed but is at a normal position; Fig. 3 is a view of the same portion of the television receiver as Fig. 2, illustrative of a state in which the front window frame of the cabinet is elastically deformed;

Fig. 4 is a cross-sectional partial side view showing a state in which a dimensional compensating member is formed integrally with the cabinet on an inner side of the front window frame of the cabinet; and

Fig. 5 is a vertical cross-sectional side view of a top portion of a conventional television receiver including a cathode ray tube.

Fig. 1 is a partially exposed perspective view illustrating a relationship between a cabinet 10 of a television receiver and a cathode ray tube 8 which are to be assembled, as viewed from a back side thereof. Metallic fixing brackets 9 each having an opening for a fastener 12 are fixedly attached at four corner positions on side surfaces of the cathode ray tube 8. The cabinet 10 is a box-like body of which front and back faces are open. the open front face of the box-like body is a window A corresponding to a face 8a of a cathode ray tube 8. In this specification, wall portions of the cabinet surrounding the window A and in contact with a peripheral edge portion of the face 8a are defined as front window frames 10, 10b, 10c, and 10d. Four bosses 11 for fixedly holding the cathode ray tube 8 are provided integrally with the cabinet 10 on inner surfaces of the front window frames so as to respectively correspond to four corners of the rectangular window A. Each boss 11 is a female threaded member. The brackets 9 are fixed to distal ends of the bosses 11 and screws 12 are engaged in female threaded holes of the bosses 11, thereby securing the bracket 9 to the boss 11.

Referring to Fig. 2, a thickness of the front window frame 10a is gradually reduced from its proximal end 10A in communication with a top wall of the cabinet 10 toward its free end 10B. It should be noted that the other frames 10b, 10c and 10d have the same form of thickness as the frame 10a. The form of the front window frame 10a assures relatively ready deformation of the front window frame 10a elastically outwardly, in accordance with the object of the invention. Fig. 2 shows a state that the cathode ray tube 8 has already been assembled in the cabinet 10. The front window frame 10a is at a normal position where it is not elastically deformed. In Fig. 2, a height 11a from a horizontal position of the free edge 10B, regarded as a reference position, to a distal end portion of the boss 11 is equal to an interval 9a between the horizontal position of the free edge 10B and the position of the bracket 9. In this state, the interval 9a has a required correct value such that a variation in a dimensional relationship between the bracket 9 and the cathode ray tube 8 is minimised.

Fig. 3 is a view similar to Fig. 2, but in the drawing, the bracket 9 is not correctly attached on the cathode ray tube 8, in contrast with Fig. 2. More specifically, the interval 9b between the horizontal position of the free edge 10B and the position of the bracket is larger than the above-described length 9a. Accordingly, the front window frame 10a is elastically deformed forwardly, that is, outwardly, by a distance corresponding to the difference (9b - 9a). A variation of the position of the bracket 9 on the cathode ray tube 8 is compensated by the elastic deformation of the front window frame 10a. When the front window frame 10a is obliquely deformed outwardly, the boss 11 provided on the front window frame 10a may be also inclined away from the horizontal, whereas it should be noted that state of the boss is not necessary shown correctly in the drawing.

Fig. 4 is a partial elevational section illustrative of a state in which a dimensional compensating member 13 is formed integrally with the cabinet body 10 on an inner side of the front window frame 10a of the cabinet body 10, the dimensional compensating member being in a compressed condition. The dimensional compensating member 13 is moulded integrally with the cabinet body during injection-moulding the cabinet 11 from resin, and it may be regarded as one portion of the front window frame. The other front window frames have also a dimensional compensating member, respectively. Preferably, all dimensional compensating members are formed integrally as a one piece member.

The dimensional compensating member 13 is softer than the resin material of forming the cabinet, which dimensional compensating member compensates a variation of the position of the bracket on the cathode ray tube 8, thanks to elastic deformation of the dimensional compensating member 13.

As will be apparent from the above, according to the invention, it is possible to accommodate the cathode ray tube within the cabinet without separate dimensional compensating members to be interposed between the cabinet and the cathode ray tube.

Claims

1. A television receiver including a cabinet (10) having a window (A) and front window frames (10a,b,c,d) which surrounds said window (A), wherein a portion of each window frame (10a,b,c,d) is formed to be elastically deformable outwardly due to contact between the cathode ray tube (8) and the cabinet (10) when assembling them, and a variation in a dimensional relationship between the cabinet (10) and the cathode ray tube (8) caused when positioning the cathode ray tube (8) in the cabinet (10) is compensated for by the elastic deformation of the



the cabinet and a front window frame of the cabinet is not deformed but is at a normal position; Fig. 3 is a view of the same portion of the television receiver as Fig. 2, illustrative of a state in which the front window frame of the cabinet is elastically deformed;

Fig. 4 is a cross-sectional partial side view showing a state in which a dimensional compensating member is formed integrally with the cabinet on an inner side of the front window frame of the cabinet; and

Fig. 5 is a vertical cross-sectional side view of a top portion of a conventional television receiver including a cathode ray tube.

Fig. 1 is a partially exposed perspective view illustrating a relationship between a cabinet 10 of a television receiver and a cathode ray tube 8 which are to be assembled, as viewed from a back side thereof. Metallic fixing brackets 9 each having an opening for a fastener 12 are fixedly attached at four corner positions on side surfaces of the cathode ray tube 8. The cabinet 10 is a box-like body of which front and back faces are open. the open front face of the box-like body is a window A corresponding to a face 8a of a cathode ray tube 8. In this specification, wall portions of the cabinet surrounding the window A and in contact with a peripheral edge portion of the face 8a are defined as front window frames 10, 10b, 10c, and 10d. Four bosses 11 for fixedly holding the cathode ray tube 8 are provided integrally with the cabinet 10 on inner surfaces of the front window frames so as to respectively correspond to four corners of the rectangular window A. Each boss 11 is a female threaded member. The brackets 9 are fixed to distal ends of the bosses 11 and screws 12 are engaged in female threaded holes of the bosses 11, thereby securing the bracket 9 to the boss 11.

Referring to Fig. 2, a thickness of the front window frame 10a is gradually reduced from its proximal end 10A in communication with a top wall of the cabinet 10 toward its free end 10B. It should be noted that the other frames 10b, 10c and 10d have the same form of thickness as the frame 10a. The form of the front window frame 10a assures relatively ready deformation of the front window frame 10a elastically outwardly, in accordance with the object of the invention. Fig. 2 shows a state that the cathode ray tube 8 has already been assembled in the cabinet 10. The front window frame 10a is at a normal position where it is not elastically deformed. In Fig. 2, a height 11a from a horizontal position of the free edge 10B, regarded as a reference position, to a distal end portion of the boss 11 is equal to an interval 9a between the horizontal position of the free edge 10B and the position of the bracket 9. In this state, the interval 9a has a required correct value such that a variation in a dimensional relationship between the bracket 9 and the cathode ray tube 8 is minimised.

Fig. 3 is a view similar to Fig. 2, but in the drawing, the bracket 9 is not correctly attached on the cathode ray tube 8, in contrast with Fig. 2. More specifically, the interval 9b between the horizontal position of the free edge 10B and the position of the bracket is larger than the above-described length 9a. Accordingly, the front window frame 10a is elastically deformed forwardly, that is, outwardly, by a distance corresponding to the difference (9b - 9a). A variation of the position of the bracket 9 on the cathode ray tube 8 is compensated by the elastic deformation of the front window frame 10a. When the front window frame 10a is obliquely deformed outwardly, the boss 11 provided on the front window frame 10a may be also inclined away from the horizontal, whereas it should be noted that state of the boss is not necessary shown correctly in the drawing.

Fig. 4 is a partial elevational section illustrative of a state in which a dimensional compensating member 13 is formed integrally with the cabinet body 10 on an inner side of the front window frame 10a of the cabinet body 10, the dimensional compensating member being in a compressed condition. The dimensional compensating member 13 is moulded integrally with the cabinet body during injection-moulding the cabinet 11 from resin, and it may be regarded as one portion of the front window frame. The other front window frames have also a dimensional compensating member, respectively. Preferably, all dimensional compensating members are formed integrally as a one piece member.

The dimensional compensating member 13 is softer than the resin material of forming the cabinet, which dimensional compensating member compensates a variation of the position of the bracket on the cathode ray tube 8, thanks to elastic deformation of the dimensional compensating member 13.

As will be apparent from the above, according to the invention, it is possible to accommodate the cathode ray tube within the cabinet without separate dimensional compensating members to be interposed between the cabinet and the cathode ray tube.

Claims

1. A television receiver including a cabinet (10) having a window (A) and front window frames (10a,b,c,d) which surrounds said window (A), wherein a portion of each window frame (10a,b,c,d) is formed to be elastically deformable outwardly due to contact between the cathode ray tube (8) and the cabinet (10) when assembling them, and a variation in a dimensional relationship between the cabinet (10) and the cathode ray tube (8) caused when positioning the cathode ray tube (8) in the cabinet (10) is compensated for by the elastic deformation of the



portions of the window frames (10a,b,c,d), characterised in that said window frames (10a,b,c,d) are an integral part of wall portions of the cabinet (10).

2. A television receiver according to claim 1, characterised in that each of the front window frames (10a,b,c,d) is gradually reduced in thickness from its proximal end portion (10A) in communication with a wall of the cabinet (10) towards its free end (10B).
3. A television receiver according to claim 1, characterised in that a dimensional compensating member (13) which is softer than a material of the cabinet body, is integrally formed with the cabinet (10) by moulding and is provided on inner sides of the window frames (10a,b,c,d) such that the dimensional compensating member (13) compensates for a variation in position of a bracket (9) on the cathode ray tube (8) due to elastic deformation of said dimensional compensating member (13).
4. A television receiver according to claims 1 to 3, characterised in that the cathode ray tube (8) is assembled with the cabinet (10) by means of fixing brackets (9) attached to sides of the cathode ray tube (8).
5. A cabinet for a television receiver has a window (A) and front window frames (10a,b,c,d) which surround said window (A), wherein a portion of each window frame (10a,b,c,d) is formed to be elastically deformable outwardly such that, in use, when they are contacted by a cathode ray tube (8) assembled with the cabinet (10), a variation in a dimensional relationship between the cabinet (10) and the cathode ray tube (8) assembled therewith caused when positioning said cathode ray tube (8) in the cabinet (10) is compensated for by the elastic deformation of the portions of the window frames (10a,b,c,d), characterised in that said window frames (10a,b,c,d) comprise wall portions of said cabinet (10).

Patentansprüche

1. Fernsehempfänger aufweisend ein Gehäuse (10) mit einem Fenster (A) und Vorderfensterrahmen (10a,b,c,d), welche das Fenster (A) umgeben, wobei ein Abschnitt jedes Fensterrahmens (10a,b,c,d) so ausgebildet ist, daß er durch die Berührung zwischen der Kathodenstrahlröhre (8) und dem Gehäuse (10) bei deren Zusammenbau elastisch nach außen verformbar ist, und eine beim Positionieren der Kathodenstrahlröhre (8)

in dem Gehäuse (10) bewirkte Variation einer Maßbeziehung zwischen dem Gehäuse (10) und der Kathodenstrahlröhre (8) durch die elastische Verformung der Abschnitte der Fensterrahmen (10a,b,c,d) kompensiert wird, dadurch gekennzeichnet, daß die Fensterrahmen (10a,b,c,d) ein integrierter Teil von Wandabschnitten des Gehäuses (10) sind.

2. Fernsehempfänger nach Anspruch 1, dadurch gekennzeichnet, daß sich jeder der Vorderfensterrahmen (10a,b,c,d) von seinem Proximalendabschnitt (10A), der mit einer Wand des Gehäuses (10) in Verbindung steht, auf sein freies Ende (10B) zu allmählich in der Dicke verringert.
3. Fernsehempfänger nach Anspruch 1, dadurch gekennzeichnet, daß ein Maßkompensationselement (13), das weicher als ein Material des Gehäusekörpers ist, mit dem Gehäuse (10) integriert durch Formen ausgebildet ist und an Innenseiten der Fensterrahmen (10a,b,c,d) so vorgesehen ist, daß das Maßkompensationselement (13) eine Variation der Position eines Trägers (9) an der Kathodenstrahlröhre (8) durch elastische Verformung des Maßkompensationselementes (13) kompensiert.
4. Fernsehempfänger nach den Ansprüchen 1 bis 3 dadurch gekennzeichnet, daß die Kathodenstrahlröhre (8) mit dem Gehäuse (10) mittels an Seiten der Kathodenstrahlröhre (8) befestigten Befestigungsträgern (9) zusammengebaut ist.
5. Gehäuse für einen Fernsehempfänger mit einem Fenster (A) und Vorderfensterrahmen (10a,b,c,d), die das Fenster (A) umgeben, wobei ein Abschnitt jedes Fensterrahmens (10a,b,c,d) so ausgebildet ist, daß er auf solche Weise nach außen elastisch verformbar ist, daß, wenn eine mit dem Gehäuse (10) zusammengebaute Kathodenstrahlröhre (8) sie im Gebrauch berührt, eine beim Positionieren der Kathodenstrahlröhre (8) in dem Gehäuse (10) bewirkte Variation einer Maßbeziehung zwischen dem Gehäuse (10) und der damit zusammengebauten Kathodenstrahlröhre (8) durch die elastische Verformung der Abschnitte der Fensterrahmen (10a,b,c,d) kompensiert wird, dadurch gekennzeichnet, daß die Fensterrahmen (10a,b,c,d) Wandabschnitte des Gehäuses (10) beinhalten.

Revendications

1. Un poste récepteur de télévision comprenant une gaine (10) comportant une fenêtre (A) et un cadre de face (10a, b, c, d), qui entoure ladite fenêtre



- (A), une section de chacun des cadres de fenêtre étant réalisée de façon à être élastiquement déformable vers l'extérieur grâce au contact entre le tube cathodique (8) et la gaine (10) lors de l'assemblage et ceci de manière à ce qu'une variation de la dimension de la gaine (10) par rapport au tube cathodique (8), résultant de la mise en place du tube cathodique (8) dans la gaine, soit compensée par la déformation élastique des sections des cadres de fenêtre (10a, b, c, d), caractérisé en ce que lesdits cadres de fenêtre (10a, b, c, d) constituent une partie intégrale des éléments de paroi de ladite gaine (10). 5 10
2. Un poste récepteur de télévision selon la revendication 1, caractérisé en ce que l'épaisseur de chacun des cadres de fenêtre de face (10a, b, c, d) diminue progressivement à partir de sa partie d'extrémité (10A) en communication avec un paroi de la gaine (10) vers son extrémité libre (10B). 15 20
3. Un poste récepteur de télévision selon la revendication 1, caractérisé en ce qu'un élément de compensation de dimension (13), qui est en un matériau plus mou qu'un matériau du corps de la gaine, est réalisé par moulage de façon à être solidaire de la gaine (10) et est pourvu sur des côtés intérieurs des cadres de fenêtre (10a, b, c, d) de manière à ce que l'élément de compensation de dimension (13) compense une variation de position d'un support (9) sur le tube cathodique (8) grâce à la déformation élastique dudit élément de compensation de dimension (13). 25 30
4. Un poste récepteur de télévision selon les revendications 1 à 3, caractérisé en ce que le tube cathodique (8) est assemblé avec la gaine (10) par moyen de supports de fixation (9) fixés aux côtés du tube cathodique (8). 35 40
5. Une gaine pour un poste récepteur de télévision comportant une fenêtre (A) et un cadre de fenêtre de face (10a, b, c, d), qui entoure ladite fenêtre (A), une section de chacun des cadres de fenêtre (10a, b, c, d) étant réalisée de façon à être élastiquement déformable vers l'extérieur de manière à ce que, quand ils sont mis en contact, lors de l'utilisation, avec un tube cathodique (8) assemblé avec la gaine (10), une variation de la dimension de la gaine (10) par rapport au tube cathodique (8) assemblé avec celle-là, résultant de la mise en place du tube cathodique (8) dans la gaine (10), soit compensée par la déformation élastique des sections des cadres de fenêtre (10a, b, c, d), caractérisée en ce que lesdits cadres de fenêtre (10a, b, c, d) constituent des éléments de paroi de ladite gaine (10). 45 50 55

