# United States Patent

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[73] Assignee **Motorola, Inc.**
**Franklin Park, Ill.**


[54] **DEFLECTION YOKE-HOUSING ASSEMBLY**
**14 Claims, 5 Drawing Figs.**


[52] **U.S. Cl.** ..... **335/212,** 178/7.81
[51] **Int. Cl.** ..... **H01f 1/00**
[50] **Field of Search** ..... 335/210, 212; 313/76, 77; 178/7.8, 7.81



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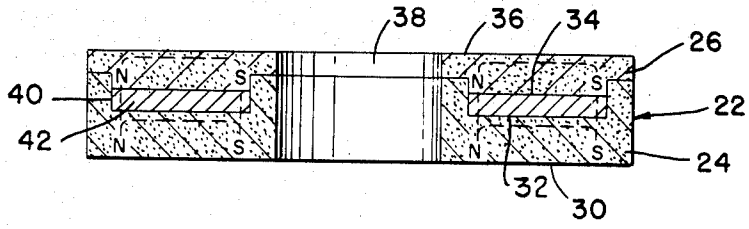


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**ABSTRACT:** A housing assembly for a toroid yoke used in a television receiver is formed with an inner core sheath made of nonmagnetic material in the form of a truncated cone, with four locating fins located at equal distances about its periphery for facilitating locating of the beginning and termination of the windings of the yoke and for facilitating mounting of the core assembly within a main housing. The main housing is of substantially cylindrical configuration and has two guide channels for slidably engaging two of the support fins and two slots in which a slide clamp mounted on a corresponding fin on the yoke assembly is positioned for movement.

The housing further includes a reduced diameter portion integrally formed therewith and resiliently attached to the yoke housing for expansion and contraction to engage a range of different cathode-ray tube neck diameters.

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SHEET 1 OF 2

FIG.1

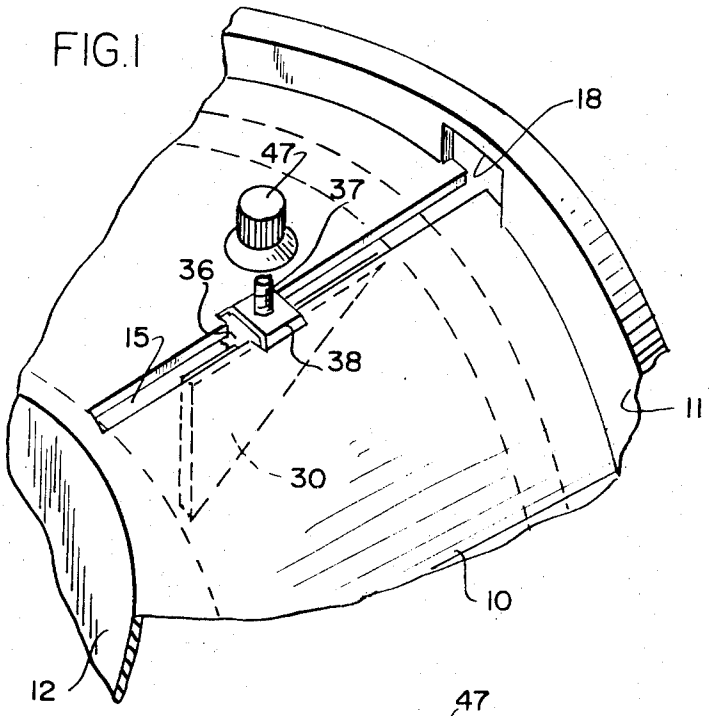
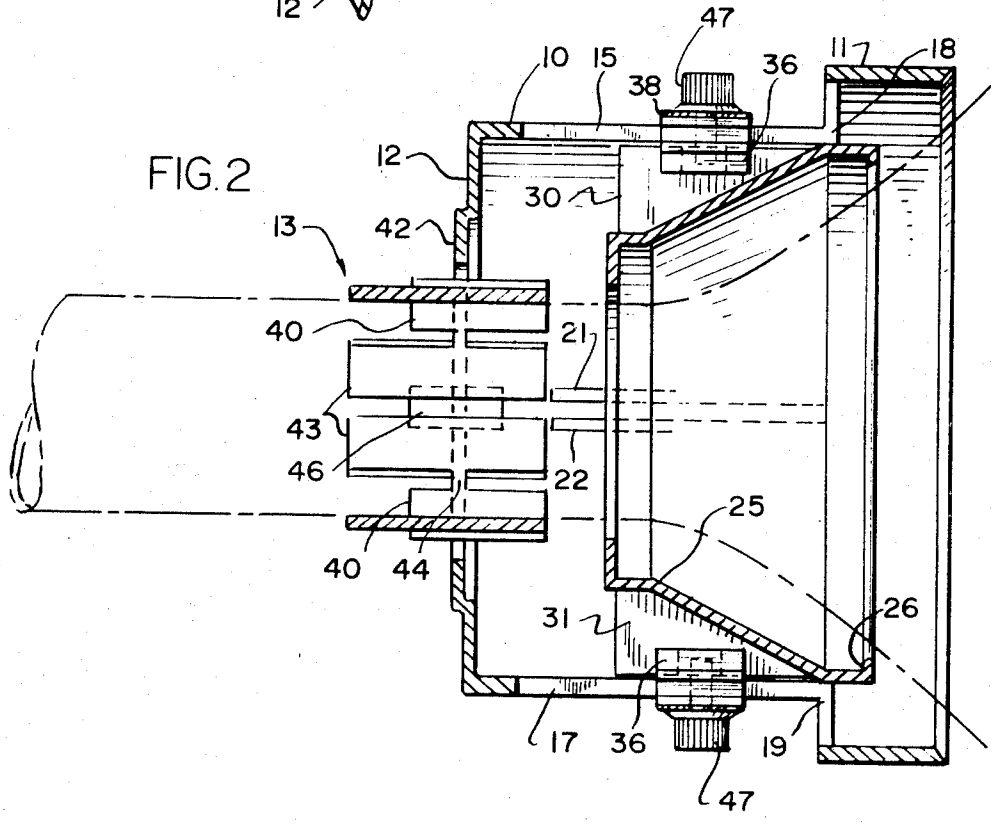



FIG.2




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FIG. 3

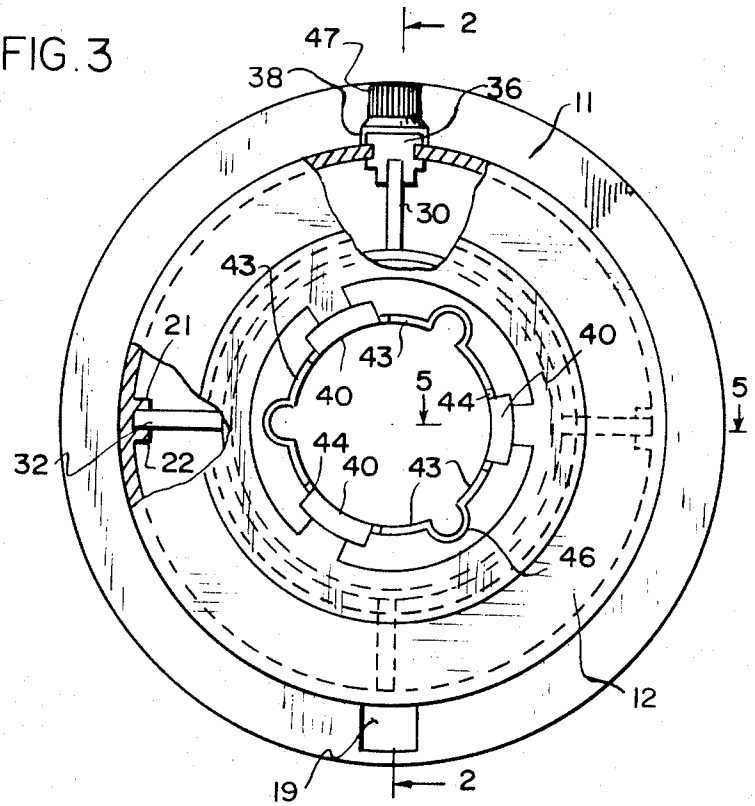



FIG. 4

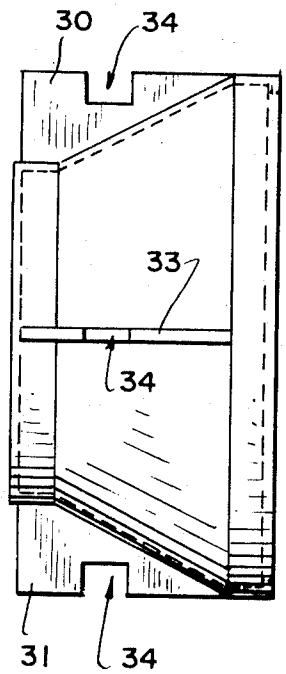
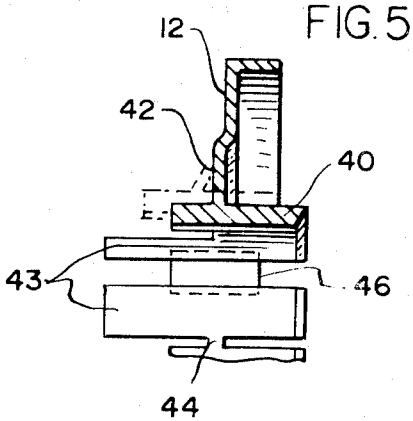



FIG. 5




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# DEFLECTION YOKE-HOUSING ASSEMBLY

## BACKGROUND OF THE INVENTION

In television receivers it is necessary to provide a deflection yoke, overlying and concentric with the neck of the cathode-ray tube, for the horizontal and vertical deflection windings necessary to deflect the electron beams within the tube in accordance with signals applied to the deflection windings. It is desirable that the yoke position on the neck of the cathode ray tube is adjustable and that, in addition, the yoke assembly may be used with a relatively large range of cathode-ray tube neck diameters.

It further is desirable to use a yoke housing which affords protection for the deflection yoke, while permitting accurate location of the yoke within the housing with respect to the housing itself and with respect to the neck of the cathode-ray tube.

Assemblies exist in the prior art for housing and protecting the deflection yoke of a television receiver and mount on cathode-ray tube necks of various sizes. Most such assemblies, however, are relatively complex, are restricted to a relatively narrow range of cathode-ray tube necks with which they may be used, or do not permit simple and accurate location of the deflection yoke on the cathode-ray tube neck.

## SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide an improved deflection yoke housing.

It is an additional object of this invention to provide a deflection yoke housing which is of relatively simple construction.

It is another object of this invention to provide a deflection yoke housing compatible with a wide range of cathode-ray tube neck diameters.

It is a further object of this invention to provide a deflection yoke-housing assembly with a core member having locating fins thereon for facilitating location of the deflection windings on the core member and operative to slidably locate the core member within an outer housing member.

In accordance with a preferred embodiment of this invention, a deflection yoke-housing assembly includes a hollow truncated conical core member for supporting the deflection windings, with the core member having guide fins attached thereto.

The edges of the fins extend substantially parallel to the axis of the core member for location within a hollow housing member having guide fin receiving channels formed therein for slidably accommodating the guide fins of the core member. The housing member further has cathode-ray tube neck engaging sections at the rear forming a reduced diameter portion to locate the housing member concentrically about the neck of a cathode-ray tube. The neck engaging sections are attached to the housing with stiff flexible rib members which permit axial displacement of the neck engaging sections to accommodate different diameters of cathode-ray tube necks. In a specific form, resilient spring members interconnect the neck engaging sections to urge them together to form a minimum diameter opening as the reduced diameter portion of the housing member.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial cutaway perspective view illustrating a portion of a preferred embodiment of a deflection yoke-housing assembly;

FIG. 2 is a side sectional view of a deflection yoke-housing assembly of the type illustrated in part in FIG. 1;

FIG. 3 is a rear view of the deflection yoke housing;

FIG. 4 is a side view of a portion of the assembly shown in FIGS. 1, 2 and 3; and

FIG. 5 is a sectional view, taken along the line 5—5 in FIG. 3, illustrating a feature of the assembly.



## DETAILED DESCRIPTION

Referring now to the drawing in which like reference numbers are used throughout the several views to designate the same or similar components, there is shown in FIGS. 1 and 2 a deflection yoke-housing assembly including an outer housing 10, comprising a hollow generally cylindrical body portion with an enlarged flange 11 at one end, for receiving a deflection yoke. The housing 10 has an annular wall 12 at the other end for supporting a cathode-ray tube neck engaging assembly 13, with the assembly 13 providing an opening of reduced diameter for receiving and engaging the neck of a cathode-ray tube of a television receiver or the like. Such a cathode-ray tube neck has been shown in dotted lines in FIG. 2 to illustrate the manner of mounting the assembly on a cathode-ray tube.

In order to provide means for mounting a deflection yoke for the cathode-ray tube within the housing 10, a pair of diametrically opposite, axially extending slots 15 and 17 are formed in the housing 10. The slots 15 are closed at the end adjacent to the rear wall 12 and open in a pair of apertures 18 and 19 in the flange 11 to permit the insertion of clamps from outside the outer housing 10 into the slots 15 and 17. The flange 11 bridges the open ends of the apertures 18 and 19 to maintain the width of the slots 15 and 17 are a pair of diametrically at the open end and also provides rigidity for the outer housing 10. Located at an angle of 90° from the slots 15 and 17 are a pair of diametrically opposite channels each formed between a pair of spaced, axially extending ribs 21 and 22 as most clearly shown in FIGS. 2 and 3.

The yoke assembly to be mounted within the outer housing 10 includes a hollow core sheath 25 in the form of a truncated cone, the internal dimensions of which substantially conform with the external dimensions of a ferrite core or the like which is to be mounted within the core sheath 25. The material out of which the core sheath 25 and the outer housing 10 are made is nonmagnetic and preferably is a thermoplastic material exhibiting substantial rigidity. A lip 26 is provided at the largest internal diameter of the yoke sheath 25, with insertion of a core into the core sheath 25 causing expansion of the core sheath at the lip 26. The lip 26 then reassumes the position shown most clearly in FIG. 2 to hold the core in place once the edge of the core has passed the inner edge of the lip 26.

Four guide fins 30, 31, 32 and 33 are attached at 90° intervals to the outer side of the core sheath 25, with the upper or outer edges of the fins 30, 31, 32 and 33 extending parallel to the axis of the core sheath 25 from the greatest outside diameter, as most clearly shown in FIG. 4. When a core is in place within the core sheath 25, horizontal and vertical deflection windings may be wound on the core and over the core sheath 25 in accordance with a distribution to provide the desired deflection of cathode-ray beams within the cathode-ray tube on which the deflection yoke is to be mounted. As an aid in locating the windings for subsequent assembly into the outer housing 10 the fins 30, 31, 32 and 33 provide convenient marking points for starting and terminating the vertical and horizontal windings during formation of the toroidal yoke assembly.

The guide fins 30, 31, 32 and 33 also each include a slide clamp mounting notch 34 therein; and after the windings have been completed on the core assembly, the notches 34 in the fins 30 and 31 are each provided with slide clamps 36 made of non magnetic material. The clamps 36 are attached in the slots 34 by any suitable means such as force fitting or cementing. The slide clamps 36 have longitudinal slots on each side thereof for engaging the respective edges of the slots 15 and 17 when the core sheath 25 is placed in the outer housing 10.

The apertures 18 and 19 have sufficient clearance to permit the passage of the slide clamps 36 therethrough when the core assembly including the core sheath 25 is inserted into the open end of the housing 10 under the flange 11. The apertures 18 and 19 also permit the passage of threaded inserts 37 (most clearly seen in FIG. 1), which are molded into the tops of the

slide clamps **36** and over which metal clamping plates **38** are placed.

With the guide fins **30** and **31** provided with slide clamps **36** as shown in FIG. **2**, being guided in the slots **15** and **17**, the fins **32** and **33** are slidably guided between the pairs of channel forming ribs **21** and **22** on diametrically opposite sides of the housing **10**. Thus, the guide slots **15** and **17** and the channels formed between the channel ribs **21** and **22**, operating in conjunction with the fins **30**, **31**, **32** and **33**, provide a positive location of the core assembly within the outer housing **10**, preventing relative rotational movement between the core sheath **25** and the outer housing **10**, but permitting relative axial movement between the core sheath **25** and the housing **10**.

The housing **10** then may be mounted on the neck of a cathode-ray tube by sliding it on from left to right, as viewed in FIG. **2**. Three main neck engaging sections **40**, in the form of arcuate axially extending segments, position the housing **10** concentrically about the tube neck. These neck engaging sections **40** are flexibly mounted on the rear surface **12** of the outer housing **10** by means of stiff radially extending flexible ribs **42** which are integrally formed with the thermoplastic outer housing member **10** and act as relatively stiff springs, permitting movement of the sections **40** from the position shown in solid lines in FIG. **5** to the dotted line position to accommodate cathode-ray tube necks of different outside diameters. Because the ribs **42** bend or flex at each end, the surfaces of the main neck engaging sections **40** remain parallel with the axis of the cathode-ray tube to firmly grip the cathode-ray tube under the urging of the flexible ribs **42**.

A pair of supplemental cathode-ray tube neck engaging sections **43** are attached to each of the main neck engaging sections **40** by a small connecting bridge member **44**, best seen in FIGS. **2** and **5**. Adjacent ones of the supplemental cathode-ray tube neck engaging sections **43** further are interconnected by spring members **46** having a C- or U-shaped cross-sectional configuration. The spring members **46** resiliently urge all of the neck engaging sections **40** and **43** inwardly to a minimum diameter by pulling together the supplemental neck engaging sections **43** attached to the edges or ends thereof. Thus, the cathode-ray tube neck engaging portion **13** assumes the configuration shown in FIG. **2**.

When a cathode-ray tube neck of a diameter larger than the inside diameter of the neck engaging portion **13** shown in FIGS. **2** and **3** is encountered, sliding of the neck of the cathode-ray tube into the neck engaging portion **13** causes the ribs **42** to move generally as shown in the dotted lines in FIG. **5**. In addition, the C- or U-shaped spring members **46** open wider to expand the circumference of the circle formed by the neck engaging segments to firmly clamp the main and supplemental neck engaging segments **40** and **43** around the neck of the cathode-ray tube. When the outer housing **10** is properly located on the cathode-ray tube neck, the inner core assembly including the core sheath **25** then may be axially adjusted to the proper position by sliding it within the slots **15** and **17** until the desired position is reached. A pair of thumbscrews **47**, threadedly engaging the threaded shafts **37**, then are tightened to clamp the clamping plate **38** to the top of the housing member **10**. The plates **38** have downwardly extending flanges which engage the top of the housing **10** and draw the sliding clamps **36** tightly against the edges of the slots **15** and **17**.

If desired, a conventional split clamp may be placed around the outer portions of the neck engaging segments **43** to further secure the housing to the tube neck to thereby prevent movement of the neck engaging portion of the housing with respect to the tube neck. Sufficient resiliency however may be provided by the flexible ribs **42** and the spring members **46** to cause the yoke housing **10** to assume a rigid condition with respect to the neck of the cathode-ray tube without the necessity for employing such an additional split clamp.

The outer housing **10** and neck engaging assembly **13** can be molded as a single unit including the main neck engaging portions **40** and supplemental neck engaging portions **43**, along with the flexible ribs **42** and spring members **46**. The core sheath **25** and ribs **30**, **31**, **32** and **33** similarly may be molded as a single unit.

I claim:

1. A deflection yoke-housing assembly for use with the cathode-ray tube of a television receiver including in combination:

a core sheath for supporting the deflection windings and being of substantially hollow truncated conical configuration;

a hollow housing member including a core sheath enclosing portion with said core sheath enclosing portion having a substantially cylindrical internal configuration of a diameter sufficient to accommodate the maximum diameter of the core sheath;

at least two guide fins attached to the outside sloping surface of the core sheath, each guide fin having an edge extending substantially parallel to the axis of the core sheath

guide fin channels formed in the core sheath enclosing portion of the housing member parallel to the axis thereof for accommodating and confining the guide fins attached to the core sheath to allow axial movement of the core sheath within the housing member; and

cathode-ray tube neck engaging means on the housing member and adapted to receive a cathode-ray tube neck in engagement therewith to locate the housing member concentrically about the neck of a cathode-ray tube.

2. The combination according to claim **1** wherein the core sheath includes a nonmagnetic sheath for fitting over and confining a deflection yoke core, the guide fins being attached to the sheath.

3. The combination according to claim **1** wherein at least one of the guide fin channels formed in the housing member is a slot in the housing member extending parallel to the axis of the housing member; the combination further including slide clamp means attached to at least one of the guide fins, the slide clamp means including engaging means for cooperating with the edges of said slot for slidable movement therein, and clamping means for clamping the slide clamp means to said housing to hold the core sheath at a predetermined location within the housing member.

4. The combination according to claim **3** wherein at least one other of the guide channels includes a pair of parallel-spaced rib means on the inside of the core sheath enclosing portion of the housing member and extending parallel to the axis thereof for slidably confining a corresponding guide fin between the pair of rib means.

5. The combination according to claim **4** wherein four guide fins are attached to the core sheath substantially 90° apart, with a first pair of diametrically opposite guide fins having slide clamp means attached thereto and the housing member having corresponding slots for accommodating the slide clamp means, and the housing member further having diametrically opposite pairs of parallel-spaced rib means for slidably confining the other pair of diametrically opposite guide fins.

6. The combination according to claim **5** wherein the core sheath comprises a nonmagnetic sheath into which a core may be inserted, with the guide fins being attached to the sheath and serving to locate deflection windings to be wound on the core member and further serving to locate such deflection windings at a predetermined position within the housing member.

7. The combination according to claim **1** wherein the cathode-ray tube neck engaging means includes a plurality of axially extending arcuate neck engaging sections attached to the housing member with stiff flexible rib means to form a reduced diameter portion adapted to receive a cathode-ray tube neck in engagement therewith, the flexible rib means permitting displacement of the neck engaging sections to accommodate cathode-ray tube neck portions having different diameters, with the neck engaging sections moving in an arc to change the diameter of the reduced diameter portion, the sections remaining substantially parallel to the neck of the cathode-ray tube.

8. The combination according to claim 7 further including means interconnecting the neck engaging sections and expanding to change the diameter of said reduced diameter portion.

9. The combination according to claim 8 wherein the interconnecting means include spring means urging the neck engaging sections together to form a minimum diameter of said reduced diameter portion.

10. The combination according to claim 9 wherein the hollow housing member, the neck engaging sections, the flexible rib means, and the interconnecting means all are formed from a unitary piece of nonmagnetic material.

11. A deflection yoke-housing assembly for use with the cathode-ray tube of a television receiver including in combination:

a housing member for supporting a deflection yoke and including a hollow, generally cylindrical yoke receiving portion of a first diameter and a portion coaxial with said yoke receiving portion adapted to receive a cathode-ray tube neck in engagement therewith, the reduced diameter portion including axially extending arcuate neck engaging sections attached to the yoke receiving portion with stiff flexible rib means extending radially of the axis of the housing to permit displacement of the neck engaging sections for accommodating cathode-ray tube necks of different diameters, with the neck engaging sections moving in an arc with respect to the yoke receiving portion to change said reduced diameter portion and the flexible rib means flexing to cause the neck engaging sections to remain parallel to the neck of the cathode-ray tube.

12. The combination according to claim 11 further including resilient means interconnecting the neck sections for permitting expansion of said reduced diameter portion.

13. The combination according to claim 12 wherein the housing member, the neck engaging sections, the flexible rib means and the resilient interconnecting means are formed from a unitary piece of nonmagnetic material, with the flexible rib means and resilient interconnecting means being of such dimensions as to function as spring means.

14. The combination according to claim 13 wherein the interconnecting means are between and space apart the neck engaging sections and are in the form of a substantially U-shaped cross section, with the neck engaging sections being attached to the edges thereof for spreading apart the edges thereof to accommodate cathode-ray tube necks of different diameters.

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