Feb. 24, 1970 H. C. COLLIE, JR 3,497,843

DEFLECTION YOKE ASSEMBLY AND MOUNTING

Filed Oct. 18, 1967

FIG.1

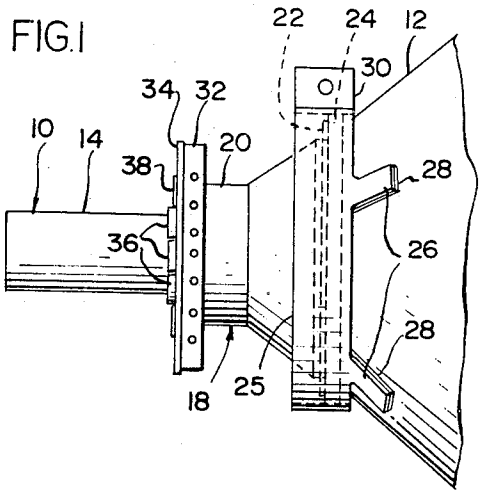


FIG.5

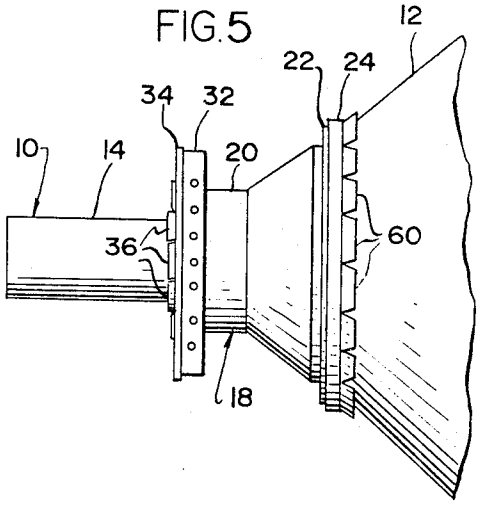


FIG.2

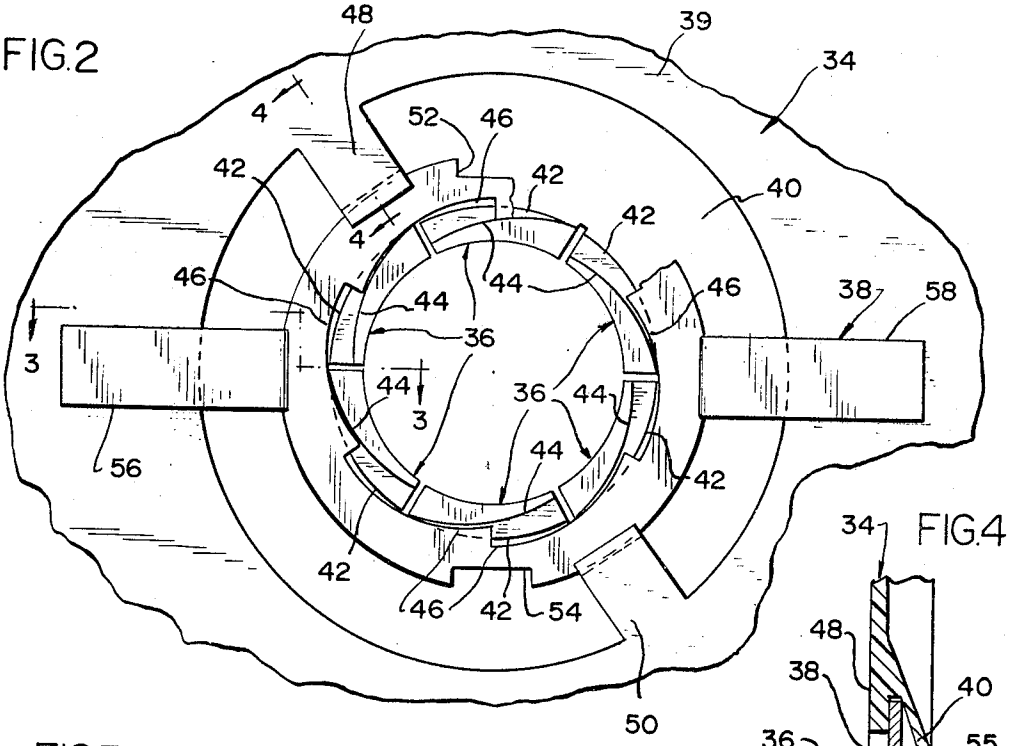


FIG.3

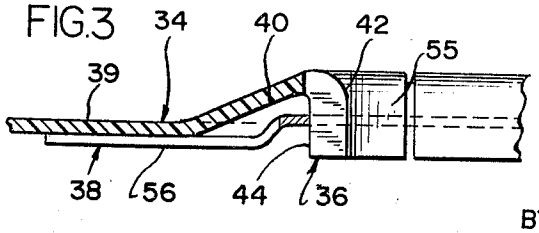


FIG.4

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DEFLECTION YOKE ASSEMBLY AND MOUNTING

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ABSTRACT OF THE DISCLOSURE

The assembly includes a yoke encircling a cathode ray tube and a cover for the yoke with rearwardly extending fingers each having a cammed outer surface. The assembly also includes a ring having a cammed inner surface to mate with the outer surfaces of the fingers and adapted to be rotated to draw the fingers against the neck of the cathode ray tube.

BACKGROUND OF THE INVENTION

After mounting a deflection yoke on a cathode ray tube, it is usually necessary to make final adjustments by axially moving the yoke along the tube neck. Once the position is selected, mounting devices located both at the front and at the back of the yoke are tightened to secure the yoke to the cathode ray tube. In present day assemblies, such devices are generally annular strap-type clamps with a screw positioned in apertures in the ends of the clamp. The strap encircles projections on the yoke assembly so that tightening of the screw secures the yoke to the cathode ray tube. However, these screws must be tightened with a tool such as a wrench or a screwdriver and because of the position of the cathode ray tube within its cabinet, it is often difficult and therefore time consuming to mate the tool with the screw. In addition, the strap has a width on the order of ⅜ inch to make good mechanical connection to the projections which extend about ½ inch or more. In a color television receiver where additional components such as convergence apparatus and purity magnets must be mounted on the cathode ray tube neck, neck space is at a premium. In the past, in order to accommodate the widths of the strap and projections, the choice has been to increase the neck length and make the cabinet that much deeped or else place the additional components closer to the assembly thereby limiting the amount of available axial room necessary to properly position the deflection yoke.

Summary of the invention

It is therefore an object of this invention to provide a device for mounting a deflection yoke on a cathode ray tube which requires no tools for tightening the same.

Another object is to provide a deflection yoke assembly and mounting therefor which requires a minimum axial space on the neck of the cathode ray tube.

In practicing a preferred form of the invention, a deflection yoke assembly includes a set of windings mounted on a support having a central opening for encompassing the neck of a cathode ray tube. The front end of the support is secured to the flared portion of the cathode ray tube. A cover mounted on the rear end of the support has a central opening to encompass the neck of the cathode ray tube. A plurality of rearwardly extending fingers integrally attached to the cover each have cammed outer surface. A clamp member having a corresponding plurality of cammed inner surfaces mates with the outer surfaces of the fingers and is adapted to be rotated with respect to the fingers to tighten the assembly to the neck of the cathode ray tube.

Description of the drawings

FIG. 1 is a side view of a cathode ray tube with the means for mounting the deflection assembly;

FIG. 2 is an end view on an enlarged scale of the mounting means of FIG. 1;

FIG. 3 is a view taken along the line 3—3 of FIG. 2;

FIG. 4 is a view taken along the line 4—4 of FIG. 2; and

FIG. 5 illustrates another embodiment of the invention.

Detailed description of the preferred embodiments

Referring now to FIG. 1, the cathode ray tube **10** has a funnel or flared portion **12**, a neck portion **14** and a front panel or viewing screen (not shown). A yoke assembly **18** has a support structure **20** encircling the neck portion **14** and part of the flared portion **12**. A set of windings represented by numeral **22** is mounted adjacent the annular front end portion **24** of the support **20** and serves to deflect the electron beams which travel from guns mounted in the neck portion **14** towards the viewing screen. Actually the windings extend rearwardly over most of the inner and outer surfaces of the support **20**. An iron core (not shown) conforming to the shape of the support **20** overlies the windings on the outer surface. A mounting ring **25** has a plurality of integral feet **26** which extend at an angle equal to the angle of taper of the flared portion **12** of the tube **10**. Two-sided adhesive tape **28** mounted on one side of the feet **26** is used to adhere the feet to the surface of the flared portion **12**. The annular front end portion **24** of the support structure **20** fits inside the ring **25** which acts as a jig to select the position of the assembly **18** so it is concentric with the neck portion **14** of the tube. After the final position is selected, a clamp **30** is used to tighten the ring **25** about the portion **24** to draw the yoke assembly **18** tightly against the cathode ray tube **10**.

The support **20** also includes a rear end **32** which is generally rectangular in shape and is formed with rearwardly extending sides to form a housing for wires connected to the windings **22**. A base portion or cover **34** is also generally rectangular in shape and has dimensions slightly increased over the dimensions of the rear end **32** and is therefore adapted to be snap fitted onto such rear end to protect the connecting wires and the windings **22**. Integrally connected to the cover **34** are a plurality of fingers **36** extending axially rearwardly from the cover. A clamp **38** tightens the fingers **36** to the neck portion **14** to secure the deflection yoke assembly **18**.

After the television receiver incorporating the cathode ray tube **10** is fully assembled, the clamps **30** and **38** are loosened and the deflection yoke assembly **18** is axially moved to optimize color purity and the like. After a position is selected, the clamps **30** and **38** are tightened to lock the assembly **18** in the desired position.

To more fully appreciate the means which secure the deflection yoke assembly to the neck portion **14** of the cathode ray tube **10**, reference is made to FIGS. 2–4. The cover **34** has a flat surface **39** and an annular inclined surface **40** which slopes toward the center and toward the flared portion **12** of the cathode ray tube **10** and terminates in a plurality of fingers **36** integrally joined to the surface **40** and extending axially rearwardly. The inner diameter of the central opening formed by fingers **36** is slightly less than the diameter of the neck portion **14** of the cathode ray tube **10** so as to fit snugly thereon and to compensate for the tolerances which may exist in the diameter of the neck portion. Each of the fingers **36** has a portion **42** adjacent the inclined surface **40** and a portion **44** extending from the portion **42** and away from the inclined surface **40**. Each of the portions **42**

has a generally annularly shaped outer surface and the outer surface of the portion **44** of each of the fingers has a cammed shape. The fingers **36** have a length so as to extend only slightly beyond the flat surface **39** of the cover **34** and therefore the cover will require a minimum of axial space on the neck portion **14** of the cathode ray tube **10**.

The clamp member **38** has a generally annular outside periphery and has a plurality of cammed surfaces **46** on its inside periphery to correspond in number and shape to the cammed surface **44** o nthe fingers **36** of the cover **34**. A pair of tabs **48** and **50** preferably molded into the cover **34** form grooves with the inclined surface (see FIG. 4). The clamp **38** has a pair of notches **52** and **54** which are respectively aligned with the tabs **48** and **50** and inserted thereover. When the clamp **38** is rotated, it will be located between the tab **48** and the inclined surface **40** on one side and between the tab **50** and surface **40** on the other side and therefore will be retained by the cover **34**. Because the outer surface of the portion **42** of the fingers **36** is annular and because the outer surface of the portion **44** o fthe fingers is cammed, a shoulder or ridge **55** is formed at their junction substantially parallel to the flat surface **39**. The ridge **55** provides a seat for the clamp **38**. Preferably the fingers **36** are slightly inclined so as to tilt radially outwardly away from the flared portion **12** of the tube **10** when the cover is inserted on the neck portion **14**. This forms a slight depression in the portions **44** of the fingers **36** for preventing slippage of the clamp **38** off of the fingers The clamp **38** also has a pair of tabs **56** and **58** which may be grasped for rotating the clamp **38**. Preferably the tabs are bent so as to be parallel to the main body portion of the clamp **38** but in a higher plane, with the main body portion positioned within the inclined surface **40** and with the tabs **56** and **58** overlying the flat surface **39** of the cover **34**. Accordingly, the mounting assembly is a compact unit and requires a minimum of axial space on the neck portion **14** of the cathode ray tube.

After the deflection yoke assembly **18** is axially adjusted to the proper position, and the clamp **30** on the front end of the support **20** is tightened, the clamp **38** is rotated with respect to the fingers **36** so that the cammed surface of the clamp **38** presents an increasing radial force against the cammed surfaces of the fingers **36** to draw the same against the neck portion **14** and secure the deflection yoke assembly **18**. It should be noted that such tightening procedure is accomplished very quickly and efficiently without the use of a tool such as a screw or nut driver. In present day sets, in order to tighten the assembly, a screw or the like must be rotated which, first requires time to position the tool on the screw and, second requires additional time to rotate the screw. The use of tools is undesirable for another reason, that is, the metal tool may touch the high voltage terminal on the cathode ray tube which may be on the order of 25 kilovolts and therefore quite dangerous to the serviceman servicing the television receiver.

A further form of the invention is illustrated in FIG. 5 where the clamp **30**, the associated screw and the mounting ring are eliminated. This is accomplished by forming a plurality of resilient feet **60** integrally with the front end **24** of the support **20** which feet have a slope slightly less than the slope of the flared portion **12** of the cathode ray tube **10**. When the deflection yoke assembly **18** is positioned on the neck portion **14** and is forced up against the flared portion **12**, the resiliency in the feet **60** force the assembly **18** rearwardly. The clamp **38** may be tightened at the desired position to preclude further axial or radial movement of the assembly **18**. This absence of radial movement will be attained as long as the feet or some portion thereof engage the flared portion **12** to provide the rearward bias of the yoke assembly **18**.

What has been described, therefore, is an improved mounting assembly for a deflection yoke which requires no tools to tighten the yoke to the cathode ray tube and requires a minimum of axial space on the neck.

What is claimed is:

1. Apparatus for mounting a deflection yoke on the neck portion of a cathode ray tube having an axis, which apparatus includes in combination, a base portion having a central opening adapted to be slipped on the neck portion of the cathode ray tube, said base portion having means for attachment to the deflection yoke, a plurality of axially extending fingers joined to said base portion, each of said fingers having a cammed outer surface, a clamp member having a corresponding plurality of cammed inner surfaces to mate with the outer surface of said fingers, whereby positioning said clamp member on said fingers and rotation of said clamp member with respect to said fingers draws said fingers against the neck portion to prevent movement of the deflection yoke with respect to the cathode ray tube.

2. In a cathode ray tube assembly having a cathode ray tube with a neck portion and a flared portion and an axis parallel to the neck portion, a deflection yoke disposed on the neck portion of the cathode ray tube and having a front end and a rear end, mounting apparatus including in combination, a base portion having a central opening adapted to be slipped on the neck portion of the cathode ray tube and against the rear end of the deflection yoke to exert an axial force towards the flared portion to bias the deflection yoke against the flared portion, a plurality of axially extending fingers joined to said base portion, each of said fingers having a cammed outer surface, a clamp member having a corresponding plurality of cammed inner surfaces mating with the outer surfaces of said fingers, whereby rotation of said clamped member with respect to said fingers draws the fingers against said neck portion to cause said base portion to maintain the bias of the deflection yoke against the flared portion.

3. A deflection yoke assembly adapted to be mounted on a cathode ray tube having a neck portion and a flared portion, which assembly includes in combination; a set of windings, a support for the windings having front and rear ends and a central opening for encompassing the neck portion of the cathode ray tube, means to secure the front end of the support to the flared portion of the cathode ray tube, a cover member mounted on said rear end of said support and having a central opening to encompass the neck portion of the cathode ray tube, a plurality of rearwardly extending fingers attached to said cover member, each of said fingers having a cammed outer surface, a clamp member having a corresponding plurality of cammed inner surfaces mating with the outer surface of said fingers, whereby rotation of said clamp member with respect to said fingers draws said fingers against the neck portion and prevents movement of the yoke assembly with respect to the cathode ray tube.

4. The deflection yoke assembly set forth in claim **3** wherein said means to secure the front end of the support comprises a plurality of resilient feet attached to said front end for bearing against said flared portion to spring bias said support rearwardly, whereby rotation of said clamp member substantially prevents movement of the assembly with respect to the cathode ray tube.

5. The deflection yoke assembly set forth in claim **3** wherein said clamp member has a pair of tabs for rotating said member.

6. The deflection yoke assembly set forth in claim **3**, wherein said cover member has a pair of tabs molded therein to form a space between said tabs and said cover member, and wherein said clamp member has a pair of notches aligned with said tabs for slipping said clamp member over said tabs and into said space, whereby rotation of said clamp member causes retention of the same by said tabs.

7. The deflection yoke assembly set forth in claim **3**

wherein said cover member has a depressed portion surrounding said fingers, said cover member having an outer portion, said fingers having an axial length to extend slightly beyond the plane of said outer portion, wherein said clamp member has a main body portion which includes the cammed inner surface and tab means for rotating the same and raised above said main body portion, said main body portion being positioned in said depressed portion to provide a compact mounting assembly.

8. The deflection yoke assembly set forth in claim 3 wherein said fingers have a forward outer surface which is annular and a rearward outer surface which is cammed to form a ridge between said surfaces, with said ridge forming a seat for said clamp member.

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