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COMBINATION CENTERING, FOCUSING, AND DEFLECTING DEVICE FOR BEAM OF CATHODE-RAY TUBES

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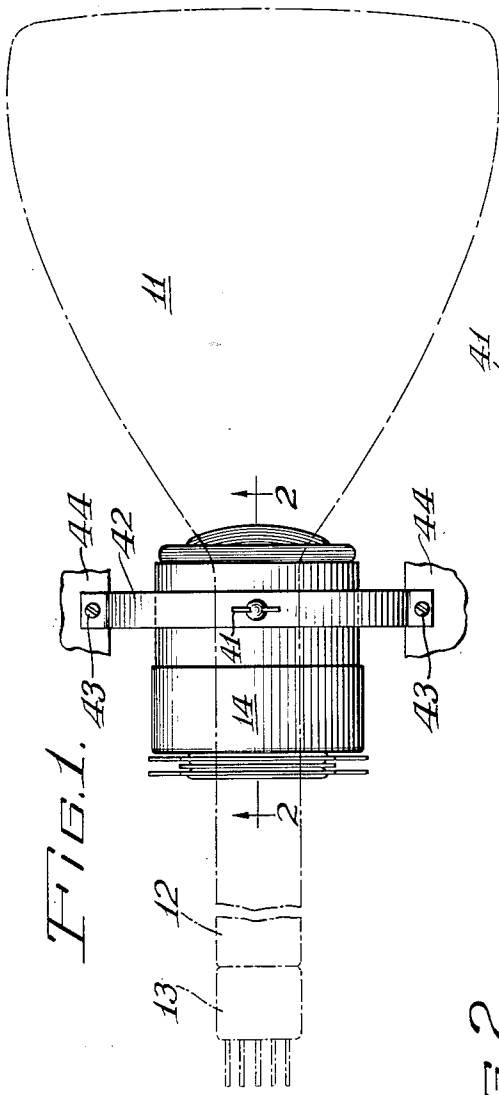


Fig. 1.

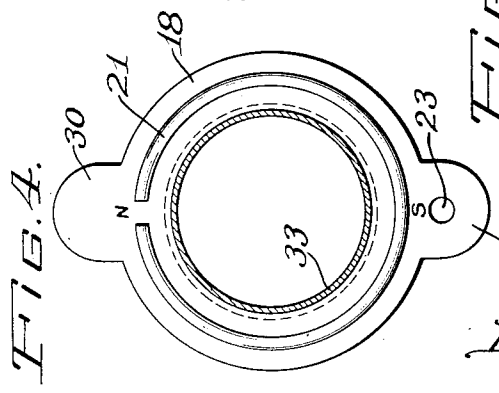


Fig. 4.

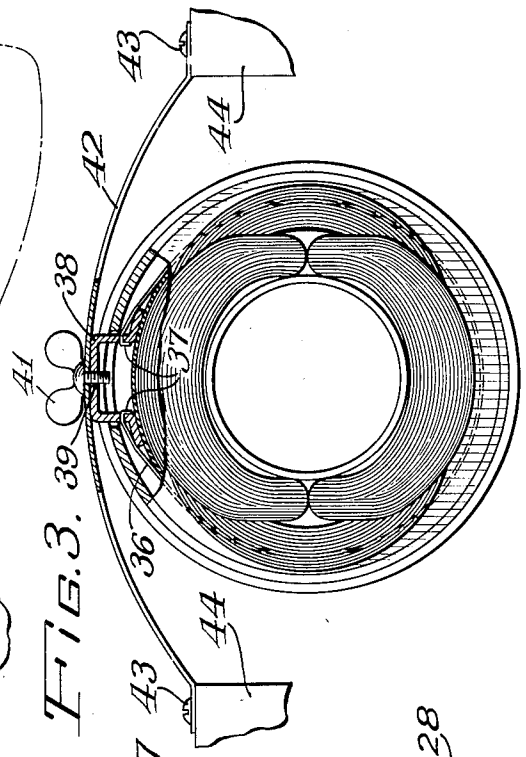


Fig. 3.

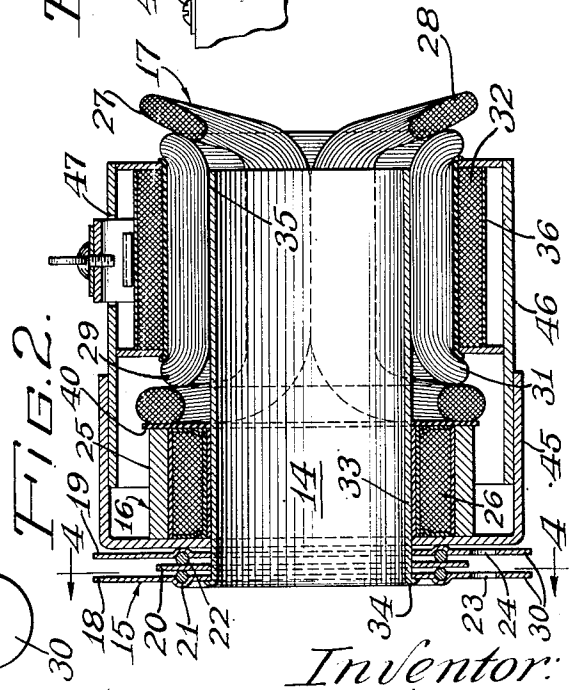


Fig. 2.

Inventor:
Arthur James Bennett
By Bair & Freeman
Attys.

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COMBINATION CENTERING, FOCUSING, AND DEFLECTING DEVICE FOR BEAM OF CATHODE-RAY TUBES

Arthur James Bennett, Cambridge, England, assignor to Pye Limited, Cambridge, England, a British company

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2 Claims. (Cl. 313—76)

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This invention relates to a combination centering, focusing and deflecting device for cathode ray tubes and to a means of assembling them into a unitary structure and mounting them relative to the neck of a cathode ray tube in proper position.

It has heretofore been common practice to provide a focusing coil and a deflecting coil on the neck of cathode ray television tubes for focusing and directing the beam thereof. A new principle and device has been discovered for centering the beam of a cathode ray tube for use in television receivers. This principle and device are described in the copending applications of Patrick Richard James Court Serial No. 144,688 filed February 17th, 1950 for Beam Centering Devices for Cathode Ray Tubes and of Thedore Obszarny and John Schmidt, Serial No. 136,294 filed December 31, 1949 for Centering Device for Beam of Cathode Ray Tubes.

The new centering device comprises a pair of permanent magnets which are mounted about the neck of the cathode ray tube and which are rotatably adjustable relatively to each other and the neck of the tube in order that the electrical field of the beam or cathode ray may be biased in any desired direction, in order to center the ray with respect to the fluorescent material on the front of the tube. This invention, however, relates primarily to providing a unitary assembly for a centering device of the type described, a focus coil and a deflecting coil, and one of its objects is to provide such an assembly which is inexpensive and readily mountable with respect to the cathode tube.

It is another object of the invention to provide a common mounting member on which the centering device, the focus coil and the deflecting coils are mounted.

It is a further object of the invention to provide a unitary structure for the centering device, focus coil and deflecting coils which is partially encased and is pleasing in appearance as well as being readily mountable.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a view of the improved unitary structure including the centering device, focus coil and deflecting coils, together with its mounting, with the cathode ray tube shown diagrammatically;

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Figure 2 is a sectional view of the unitary device taken on line 2—2 of Figure 1;

Figure 3 is an end view of the unitary device taken from the focusing coil end, with parts thereof broken away; and

Figure 4 is a sectional view of the centering device taken on line 4—4 of Figure 2.

Referring specifically to the drawings for a detailed description of the invention, numeral 11 designates generally a cathode ray tube for television sets which is provided with a neck 12 and a plug 13. The unitary assembly of centering device 15, focus coil 16 and deflecting coils 17, is shown generally at 14.

The centering device 15 includes a pair of insulating rings 18 and 19 which are identical in shape. The ring 18 carries a permanent magnet 21 in the shape of a broken ring having a north pole at the point marked "N" and a south pole at the point marked "S" in Figure 4. An identical permanent magnet 22 is positioned on the ring 19. An insulating ring 20 separates the two magnets. The ring 15 is provided with a pair of opposed tabs 30, the lower one of which has an aperture 23 therein. The ring 19 is likewise provided with a pair of opposed tabs 30, the lower one of which is provided with an aperture 24. The rings 18 and 19, with the electromagnets 21 and 22, may be rotated to any position and may be rotated relatively to each other to center the cathode ray beam. The apertures 23 and 24 in the tabs 30, shown at the lower part of Figure 2, may be used as indicia to indicate the relative position of the electromagnets and the intensity and direction of the combined magnetic fields of the two electromagnets.

The focus coil 16 comprises an outer electromagnet ring 25 and an inner energizable core 26 and is constructed in a manner well understood in the art.

The deflecting coils 17 comprise vertical deflecting coils 27 and 28 and horizontal deflecting coils 29 and 31. They are surrounded and maintained together by the coil 32 of magnetic material in a manner well understood in the art. An insulating disk 40 is disposed between the focus coil 16 and the deflecting coil 17, as it is preferable to magnetically insulate these two coils from each other for proper operation.

The centering device 15, the focus coil 16 and deflecting coils generally indicated at 17 are all mounted on an electrically insulating tube 33 formed, for example, of cardboard. The tube 33 has an edge 34 which is spun over to retain one end of the parts in position and has another opposite edge 35 which may be glued to the

deflecting coils, or secured thereto in any desired manner.

It will be noted that the rings 18 and 19 of the centering device 15 are mounted directly on the tube 33 and are rotatable thereon to any desired position or relatively to each other. The magnetic field of the two magnets 21 and 22 may, therefore, be varied and react on the cathode ray electromagnetic field in a manner so as to bias it in any desired direction and thus move the cathode ray so that it will be centered. The purpose and operation of the focus coil 16 and the deflecting coils 17 are well understood in the art and no further explanation of them is believed to be necessary.

The focus coil 16 and the most of the area of deflecting coils 17 are enclosed in a cylindrical telescoping casing, one part of which is shown at 45 and the other part at 46. The centering device 15 is not enclosed within the casing 45 and 46, since it must be adjusted from an accessible position. An aperture 47 is provided in the top of the casing portion 46 and an inverted U-shaped member extends therethrough. A metal strap 36 surrounds the deflecting coils 17 and hooks into the member 38, as shown at 37. A wing nut 41 is adapted to be threaded into a threaded aperture 39 in the top of the member 38. Supporting posts 44 are provided in the chassis of the television set (not shown) and a strap 42 extends therebetween having a suitable opening adjacent the center thereof through which the wing nut 41 extends. The strap 42 is secured to the supports 44 by screws 43.

The entire assembly 14 may, therefore, be slid over the neck 12 of the cathode ray television tube 11 and positioned thereon wherever desired. The combined unit 14 is supported mainly from the strap 42 and supports 44 and, therefore, it does not necessarily contact the neck 12 of the cathode ray television tube 11, whereby damage or implosion to the neck is minimized.

From the foregoing it will be apparent that I have provided an improved unitary structure in which a common supporting member is utilized for supporting and positioning a centering device, a focus coil and deflecting coils for a television cathode ray tube. It also provides a bearing affording rotation of the magnets of the centering device to any desired position.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure and use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. A unitary centering, focusing, and deflecting apparatus for a cathode ray tube comprising in combination, an elongated circular sleeve adapted to receive the neck of a cathode ray tube and having an outer annular shoulder at one end, a ray beam centering unit comprising a series of disks between which are sandwiched ray beam centering magnets, the disks being snugly but rotatably received on the sleeve and bottoming against the shoulder thereof, the disks being operable when rotated relative to the sleeve to control the position of the ray beam in relation to the center of the viewing screen, a cup member snugly received on the sleeve in abutting relation to the centering unit, a focusing unit received within the confines of the cup member and abutting the end face thereof, a deflecting unit snugly received upon and anchored to the sleeve adjacent the focusing unit, the deflecting unit having an outer sleeve in telescopic relation to the cup and a support member adapted to be received on a supporting bracket to sustain the entire unit in position.

2. A unitary centering, focusing, and deflecting apparatus for a cathode ray tube comprising in combination, an elongated circular sleeve adapted to receive the neck of a cathode ray tube and having an outer annular shoulder at one end, a ray beam centering unit comprising a series of disks between which are sandwiched ray beam centering magnets, the disks being snugly but rotatably received on the sleeve and bottoming against the shoulder thereof, the disks being operable when rotated relative to the sleeve to control the position of the ray beam in relation to the center of the viewing screen and having axially extending handles for manual adjustment, a cup member snugly received on the sleeve in abutting relation to the centering unit, a focusing unit received within the confines of the cup member and abutting the end face thereof, a deflecting unit snugly received upon and anchored to the sleeve adjacent the focusing unit, the deflecting unit having an outer sleeve in telescopic relation to the cup and a support member adapted to be received on a supporting bracket to sustain the entire unit in position.

ARTHUR JAMES BENNETT.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,102,421	Kuehni	Dec. 14, 1937
2,207,777	Blain	July 16, 1940
2,234,720	DeTar	Mar. 11, 1941
2,336,837	Bedford	Dec. 14, 1943
2,433,682	Bradley	Dec. 30, 1947
2,443,025	DeTar	June 8, 1948
2,456,474	Wainwright	Dec. 14, 1948
2,501,516	Holden	Mar. 21, 1950

FOREIGN PATENTS

Number	Country	Date
464,637	Great Britain	Apr. 21, 1937