

June 2, 1959

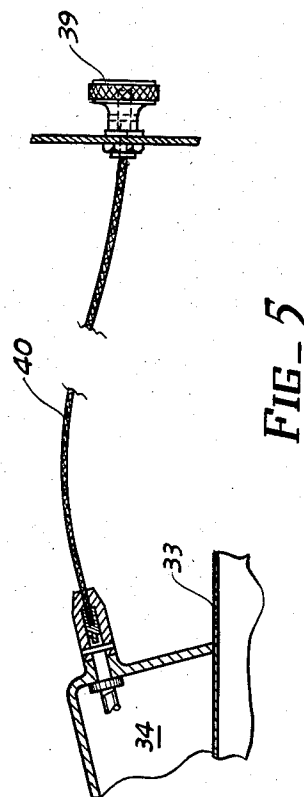
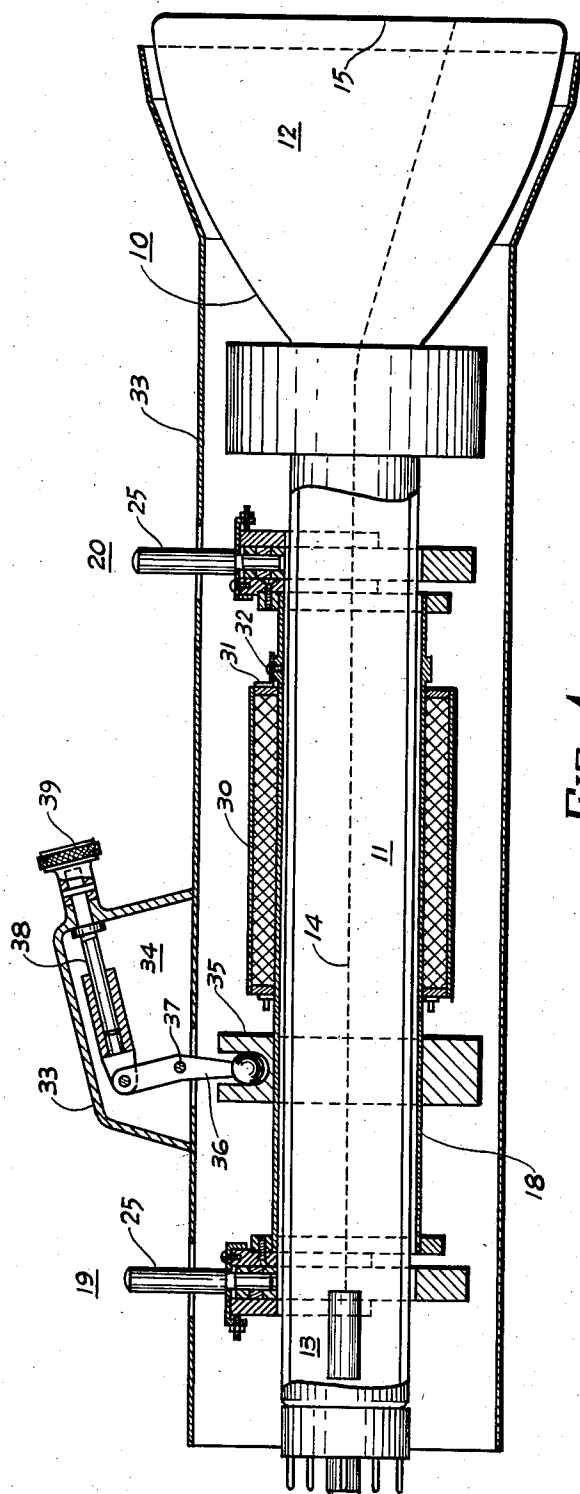
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ADJUSTABLE MOUNT ASSEMBLY FOR A CATHODE RAY TUBE

Filed June 17, 1957

2 Sheets-Sheet 1



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ADJUSTABLE MOUNT ASSEMBLY FOR A CATHODE RAY TUBE

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2 Sheets-Sheet 2

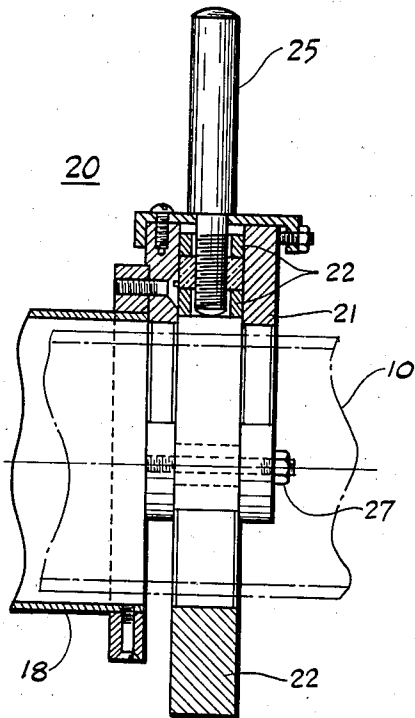


FIG. 4

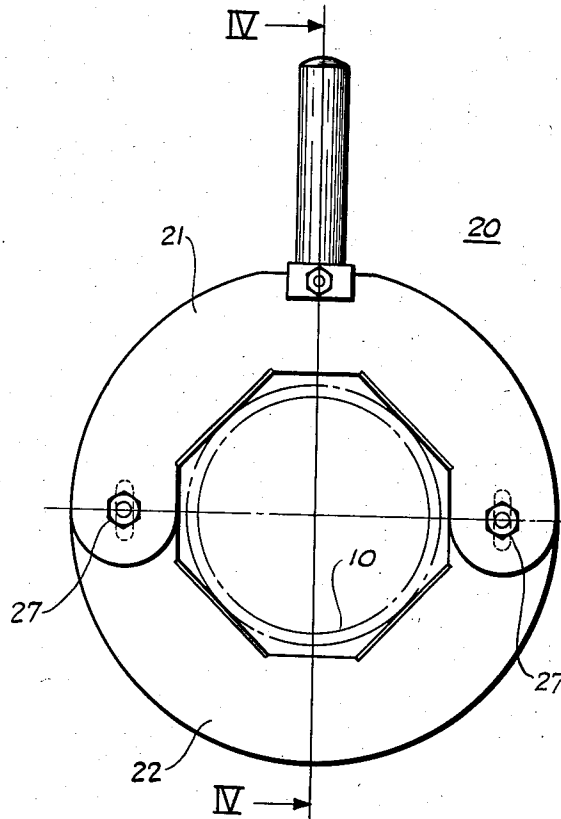


FIG. 3

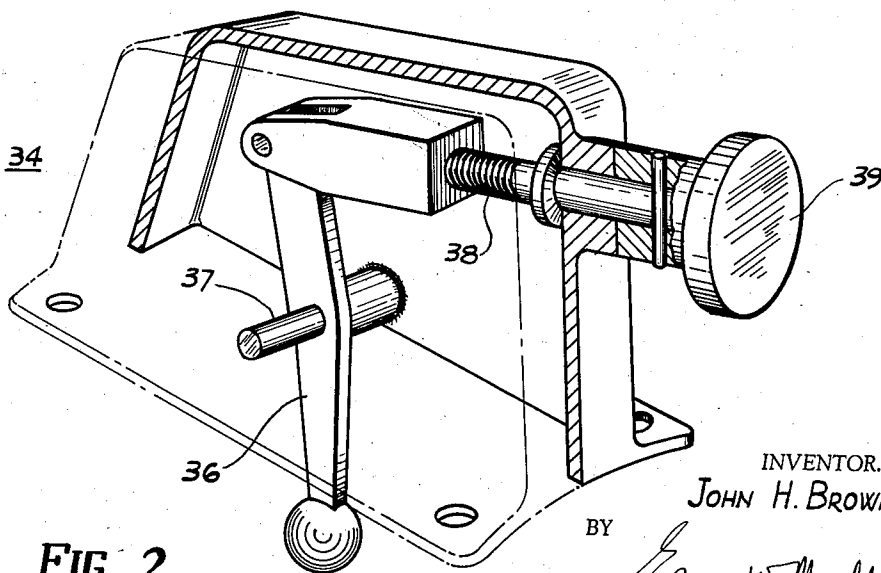


FIG. 2

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ADJUSTABLE MOUNT ASSEMBLY FOR A CATHODE RAY TUBE

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3 Claims. (Cl. 313—84)

This invention relates generally to a mount assembly for use with a cathode ray tube. More particularly, the invention includes a mount assembly which is axially adjustable with respect to the stationary cathode ray tube.

As is well known in the cathode ray tube utilization arts, it is necessary from time to time, to effect control of an electron beam generated within the cathode ray tube by use of electromagnetic coils of various types. Such coils are usually disposed about an elongated neck of the cathode ray tube. The electromagnetic coils are capable of effecting electromagnetic fields for inter-action with the electron beam generated and projected within the cathode ray tube. In most cathode ray tubes, the electron beam is generally generated at one end of the neck portion of the cathode ray tube and projected toward an enlarged section, a screen, at the other end of the tube. In the general area of the neck portion of the tube, at which the beam is generated and initially projected, it is customary to mount thereabout various desired types of such electromagnetic coils to effect, for instance, convergence or focusing or like inter-action with the electron beam aiding the utilization of the cathode ray tube.

In the prior art, it has been customary to build rather cumbersome mount assemblies, mounting them in a stationary manner, about the cathode ray tube. The mount assemblies, in turn, carried the various electromagnetic coils. The coils usually had to be physically repositioned by hand with respect to the mount assemblies in order to optimize their inter-action with the electron beam, be it for focusing or for convergence or the like. Such movement of the coils, which is usually axial movement of the coils with respect to the tube, demanded rather cumbersome and tedious mechanical repositioning or relocation of the coils with respect to the mount assembly.

The present invention overcomes these difficulties and permits a simplified repositioning of the mount assembly carrying a coil fixed thereto with respect to the tube. Generally described, the invention includes a sleeve member which is positioned about and adjacent the tube. The sleeve member carries and has fixed thereto one or more desired electromagnetic coils each capable of influencing the electron beam in a desired manner. The sleeve at each of its extremities carries a radially alignable clamping means, which means provides for radial positioning of the sleeve with respect to the neck of the tube. An adjustable mechanism may be mounted upon the stationary housing which housing, in turn, is fixed with respect to the tube thereby permitting the adjustable mechanism to move the sleeve member with respect to the tube. Such mechanism adjustment causes the sleeve member to move axially along the tube neck. The adjustable mechanism can be locally actuated or, by means of flexible cables, remotely operated, if so desired. Moving the sleeve member axially along the tube, of course, moves with it the electromagnetic coil, thereby axially displacing the coil along the tube to vary the effect of

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the coil's field action upon the electron beam changing the beam's convergence or focus conditions.

In addition to the aforementioned objects and advantages, it is an object of the present invention to provide an adjustable mount assembly which is of simple and trouble-free construction.

It is another object of this invention to provide an adjustable mount assembly for electromagnetic coils which will readily permit axial movement of one or more coils along the cathode ray tube.

It is another object of this invention to provide an adjustable mount assembly which may readily effect minute and carefully controlled axial movements of an electromagnetic coil along the cathode ray tube.

It is another object of this invention to provide a mount assembly capable of axial adjustment with respect to the cathode ray tube which may be adjusted from a point remote from the location of the mount assembly itself.

It is another object of this invention to provide an axially adjustable mount assembly capable of being directly mounted upon and carried by the cathode ray tube.

Objects and advantages other than those set forth above will be apparent when read in connection with the accompanying specification and drawings, in which:

Figure 1 is a view partly in section of an adjustable mount assembly positioned on a cathode ray tube and embodying the invention;

Figure 2 is a view in perspective of the adjusting means;

Figure 3 is a view in elevation of the radially alignable clamping means;

Figure 4 is a view in section along line IV—IV of Figure 3;

Figure 5 is a partial sectional view of the remotely controllable adjusting means.

Adverting to Figure 1, there is shown a typical cathode ray tube 10 which has a neck portion 11 and a bulb portion 12. Positioned at the end or extremity of the neck portion 11, shown symbolically, is a beam generating and projecting means 13 capable of projecting an electron beam 14 generally along the longitudinal axis of the tube 10 for impingement upon a screen 15 at the opposite end or extremity of the tube 10.

Mounted about the neck portion 11 of the tube 10 is a sleeve member 18. The sleeve member 18 may be, as shown, of a generally cylindrical shape and may be constructed of a material such as plastic, glass or other known materials capable of readily passing electromagnetic lines of flux or fields with minimal field or flux pattern distortion or losses.

Carried by and fixedly mounted to the sleeve 18 at each of its extremities is a radially alignable clamping means 19, 20. Each of the clamping means 19, 20 is capable of selectively clamping and releasing the sleeve 18 to and from the neck of the tube while simultaneously maintaining the desired spaced apart radial positioning of the sleeve 18 with respect to the tube 10. The clamping means 19, 20 further permits sliding frictional engagement with the tube 10 permitting the axial adjustment of the sleeve 18 with respect to the tube. The clamping means as illustrated by reference to clamping means 20, shown in detail in Figures 3 and 4, generally includes an upper part 21 and a lower or inner part 22. The upper part 21, as shown in Figure 3, has a forked construction and receives the lower part 22 which fits intermediate the forked construction. The lower part 22, which is of a collar like construction, is readily adjustable with respect to the upper part through threaded engagement and disengagement of a thumb adjusting screw 25 with a captive nut carried by the lower or inner part 22. Release of lower part 22 permits repositioning of the sleeve 18, and as upper part 21 remains stationary, during the release

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and repositioning, the radial spaced apart position of the sleeve and the tube is not changed by such adjustment.

It can readily be seen that rotation of the thumb screw 25 in one direction will cause the captive nut 26 to draw inner part 22 into clamping engagement with tube 10, and through interconnection with upper part 21 at bolts 27, cause like clamping of upper part 21 upon tube 10. Radial alignment of the parts 21, 22 to effect varying radial spacings from the tube 10 can be effected through releasing bolts 27 in the slotted perforations in parts 21, 22, effecting desired readjustment and tightening bolts 27.

Mounted upon and carried by the sleeve is an exemplary electromagnetic means such as a convergence coil 30. Coil 30 may be of the type shown and described in the application of Omer F. Hamann, filed March 29, 1956, Serial No. 574,726, now Patent No. 2,855,530, assigned to the common assignee hereof. Coil 30 may be fastened to the sleeve by means of a bracket 31 having a perforation therethrough for accommodating a screw 32 which, in turn, may threadingly engage the sleeve proper. The invention includes the positioning and carrying of more than one such electromagnetic means, including convergence coils, focus coils or other electromagnetic coils, upon one or more of such sleeves, each sleeve carrying one or more of such electromagnetic means. Each of the sleeves may be inter-connected with the other or carry its own adjusting means for being independently moved along the tube.

The coil 30, of course, may have attached thereto, its necessary electrical connections to effect its desired operation as set forth in Serial No. 574,726. The coil 30 in its operative condition generates an electromagnetic field which easily penetrates the sleeve member 18 (which of necessity is constructed of material offering the minimal resistance to electromagnetic lines of force), as well as, neck portion 11 to set up desired electromagnetic field patterns for inter-action with the electron beam. Many such field patterns are used in present day cathode ray tube arts. One such desired field pattern may be used to converge divergent electron beams while another may be used to effect desired focusing or lensing effects upon the cross section of the electron beam. All of these various operations, as well as others, in which an electromagnetic field interacts with the electron beam, are all considered encompassed by and within the scope of the present invention. The invention is not to be construed as limiting the use of the electromagnetic means or any of the coils generating such electromagnetic fields, as long as, the fields themselves are used in combination with an electron beam to effect an inter-action therewith.

Disposed adjacent the mount assembly is a stationary housing 33 which is fixed with respect to the tube 10 itself. The housing 33 may partially or totally surround the tube 10 and provide a platform for mounting thereon, a means 34 which is capable of being adjusted. The stationary housing 33 may preferably be made of a material capable of reasonable structural strength and capable of effecting confinement of stray electromagnetic radiations. The adjusting means 34, may effect its desired action through well known linkages, but is exemplified in the present illustration as utilizing a modified ball-and-socket arrangement to effect movement of sleeve member 18 with respect to tube 10. The socket member 35 may preferably be of collar-like construction to permit uniform force transmittal upon the sleeve member 18 and is fixedly carried by the sleeve member. The actuating ball member 36 may be pivoted intermediate its extremities at pivot 37. Pivot 37 is journaled by the housing 33 and effects force transmission from the housing 33 to the sleeve member 18. The exemplified mechanism 35, 36 can, of course, be any well known mechanism which is capable of displacing one member with respect to another along a generally axial direction. The socket member 35, of course, may be integrally formed with the sleeve member 18 or may be a portion of the sleeve mem-

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ber itself. It should be clearly understood that any desired known means of moving the sleeve with respect to the stationary housing is encompassed in the purview of this invention and it is not the intent of the invention to be limited to the exemplary adjusting mechanism shown.

The ball-and-socket arrangement 35, 36 may, in turn, through its linkage be actuated by an adjustable screw arrangement 38. Adjustment of the screw arrangement 38 by turning of a knob 39 will cause motion of the ball member 36 about its pivot 37, and from the stationary anchor of pivot 37 transmit, in turn, through the ball-and-socket arrangement 35, 36 the desired axial motion of the sleeve member 18 along the tube 10. When a desired position of the sleeve member along the tube has been achieved, the clamping means 19, 20, at the extremities of the sleeve member, may be tightened by rotation of thumb adjusting screws 25, thereby clamping the sleeve member 18 in desired radially spaced relation to the neck portion 11 of tube 10 permitting the sleeve member to maintain that position upon the tube 10. It should be obvious that release of the clamping means 19, 20 will permit axial re-positioning of the sleeve member 18 and its coil 30 to any other desired axial position within the range of the adjustment permitted by the assembly and retaining its radial spaced relation to the tube throughout the repositioning.

As shown in Figure 5, a flexible cable 40 may be attached to the screw arrangement 38 to permit adjustment of the assembly from a position remote from the assembly itself at the remotely positioned knob 39. Such remote adjustment is very desirable in that cathode ray tubes of considerable length may be used and may be remotely positioned in the equipments from the operating positions, so that an operator may desire to use such remote adjustment as he views the effects of axially positioning the sleeve member upon the electron beam at the screen of the tube. The present invention readily lends itself to effect such remote positioning.

In operation, therefore, assuming the sleeve member 18 to be clamped to the tube 10 should it be desired to effect an axial adjustment of the coil 30, release of the clamping means 19, 20 will permit an operator to rotate knob 39, which in turn, will cause the adjusting means 34 to interact with the sleeve member 18 and cause movement of the sleeve along the tube 10 to the desired operating position. When that position is achieved, the clamping means 19, 20 may again be fastened by rotation of their thumb adjusting screws 25 to clamp the sleeve member 18 to the tube 10, while simultaneously maintaining the sleeve member 18 in the desired spaced apart radial position with respect to the tube 10.

The particular embodiment of the invention illustrated and described herein is illustrative only, and the invention includes such other modifications and equivalents as may readily occur to those skilled in the art, within the scope of the appended claims.

I claim:

1. An axially adjustable mount assembly for a cathode ray tube having an electron beam generated and projected therewithin, comprising a sleeve member positioned about and adjacent the tube, at least one electromagnetic means capable of influencing the electron beam through axial displacement of the means, the electromagnetic means being fixedly mounted upon the sleeve member for movement therewith, at least a pair of radially positionable clamping means fixedly carried by and adjacent the extremities of the sleeve member for clamping and maintaining the sleeve in desired radial spaced apart position with respect to the tube, a stationary housing at least partially surrounding the tube and fixed with respect to the tube, and adjusting means interacting with the stationary housing, and the sleeve member for effecting axial movement of the sleeve member along the tube.

2. An axially adjustable mount assembly for a cathode ray tube having an electron beam generated and pro-

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jected therewithin, comprising a sleeve member positioned about and adjacent the tube, at least one electromagnetic means capable of influencing the electron beam through axial displacement of the means, the electromagnetic means being fixedly mounted upon the sleeve member for movement therewith, at least a pair of radially positionable clamping means fixedly carried by and adjacent the extremities of the sleeve member for clamping and maintaining the sleeve in desired radial spaced apart position with respect to the tube, a stationary housing at least partially surrounding the tube and fixed with respect thereto, and adjusting means interacting with the stationary housing and the sleeve member for effecting axial movement of the sleeve member along the tube, said adjusting means including a collar like socket member fixedly mounted upon the sleeve member for force transmission thereto, an actuating ball member capable of interacting with the socket member to transmit axial movement thereto journaled by the housing and an adjustable screw ar-

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rangement connected to the ball member for actuating the ball member into force transmission relation between the housing and the sleeve member whereby the sleeve member is axially moved along the tube.

3. An axially adjustable mount assembly as claimed in claim 2 wherein each of the clamping means includes a forked upper part and a lower part, each part presenting mating slots to the other part, bolts positioned in said slots to permit relative adjustment of each part to the other, said lower part carrying a captive nut, thumb screw means threadingly engaging said nut to cause clamping of the parts to the tube through force transmitted by said bolts.

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