June 6, 1967 G. A. BURDICK ETAL 3,324,328

MAGNETIC CONVERGENCE ASSEMBLY AND ELECTRON BEAM SHIELDING MEANS FOR COLOR CATHODE RAY TUBES

Filed Sept. 28, 1964 2 Sheets-Sheet 1

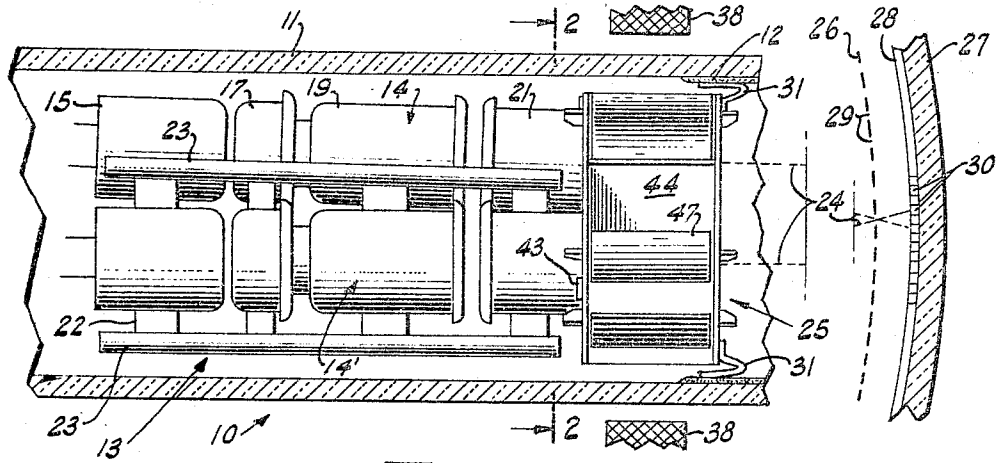


Fig. 1

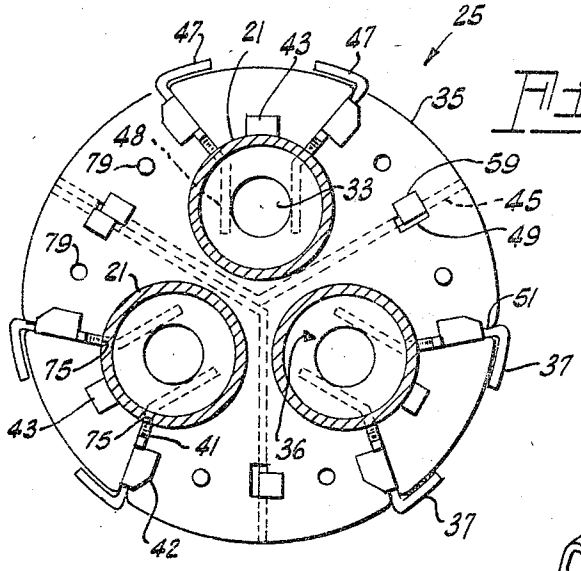


Fig. 2

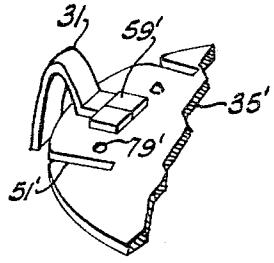


Fig. 5

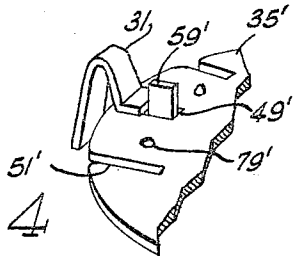


Fig. 4

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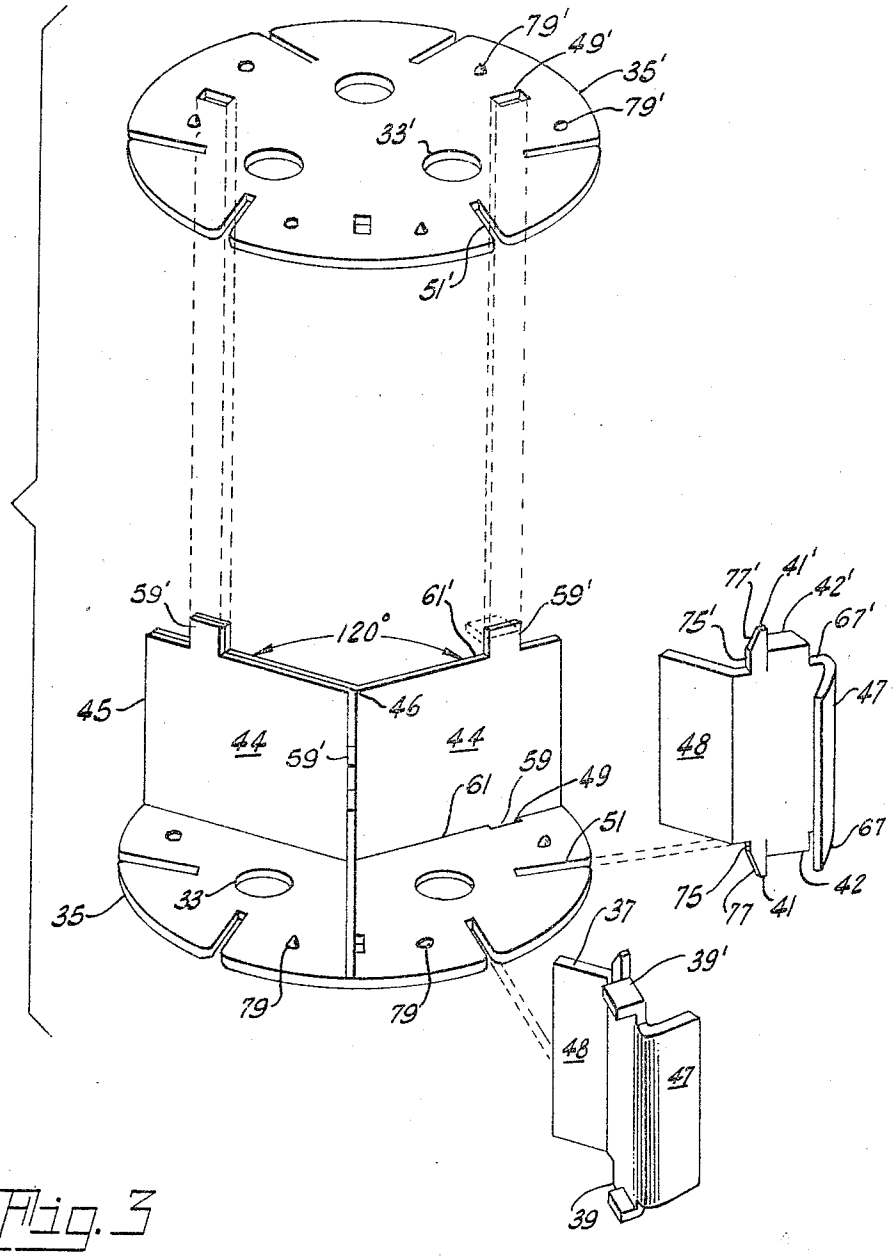


Fig. 3

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United States Patent Office 3,324,328 Patented June 6, 1967

3,324,328

MAGNETIC CONVERGENCE ASSEMBLY AND ELECTRON BEAM SHIELDING MEANS FOR COLOR CATHODE RAY TUBES

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Filed Sept. 28, 1964, Ser. No. 399,542
9 Claims. (Cl. 313—84)

This invention relates to color cathode ray tubes and more particularly to electron beam magnetic convergence assemblies for use therein.

It has been found advantageous in tri-color cathode ray tubes of the tri-dot, plural gun shadow mask variety to have means for imparting directional correction to the focused electron beams separately emanating from the respective guns. This correction facilitates accurate convergence of the beams at a plane common to the apertures of the foraminous shadow mask which is positioned adjacent the screen and thereby accurately optimizes beam landings on the proper phosphor dots of the multi-dot patterned screen disposed therebeneath on the interior surface of the face-plate of the tube. Such means are commonly referred to as magnetic beam convergence assemblies and are conventionally comprised of three pairs of magnetic pole pieces supported between two spaced wafer-like members having algined apertures therein to facilitate the passage of the electron beams therethrough. Conventionally, the several pairs of pole pieces are magnetically shielded one from the other by a metallic shielding structure which is likewise positioned between the two wafer-like members. This convergence assembly is usually located within the neck of the cathode ray tube, as an attachment to the terminal electrodes of the related electron guns and as such is oriented intermediate the guns and the shadow mask. Externally positioned sources of magnetic energy impart magnetic flux to the respective pairs of pole pieces of the convergence assembly to provide the necessary radial correction to the direction of the individual electron beams in their passage therethrough. It is conventional to affix a plurality of resilient positioners or snubbers to the outermost of the wafer-like support members to effect desired positioning of the integrated electron gun-magnetic assembly structure within the neck of the tube. This positioning is usually achieved by a plurality of spaced snubbers formed to compress against the interior surface of the neck of the tube.

Current manufacturing practice is to assemble the magnetic convergence assemblies on a jig for proper orientation of the several component parts; i.e., pole pieces, shielding, and support members, with respect to each other in the assembly. This fabrication procedure requires considerable dexterity to manipulate the various components into desired relationship and then to secure the whole by spot welding operations. Since it is essential that the convergence assembly accurately mate with the terminal electrodes of the electron guns in a definite prescribed manner to facilitate the passage of the electron beams therethrough and to effect proper beam directional control therewith, suitable means for achieving this prescribed mating is of importance. One such mating means is accomplished by jigging and welding several locating brackets on one of the two wafer-like support members in spaced relationship to the apertures therein. The terminal electrodes of the electron guns are then juxtapositionally located with respect to the positioning brackets and secured thereto by a subsequent spot welding operation. Additionally, the aforementioned snubber means are spacedly located on and welded to the outermost or top wafer-like support member of the convergence assembly in a jigging operation.

It is evident from the foregoing discussion that assembly of the magnetic convergence structure and its subsequent mating to both the electron guns and to the snubber means involves a plurality of jigging and welding processes which are costly and time consuming from a manufacturing viewpoint. In addition, a considerable amount of skill and care is required of the operators with the use of these jigs in order to achieve a uniformally satisfactory assemblage. For example, if the snubbers are not placed in the proper radial position on the convergence assembly they will be nonuniformally compressed against the interior surface of the tube neck during subsequent manufacturing operations. This will cause the magnetic assembly and the electron guns to be axially off-center with respect to the finished cathode ray tube. In addition, since the positioning brackets are affixed to only one of the wafer-like members there is only one way for the convergence assembly to be mated to the terminal electrodes of the electron guns. This necessitates jigged positioning orientation and is a definite hindrance to rapid assembly.

Accordingly, it is an object of the invention to reduce the aforementioned disadvantages and to provide a relatively inexpensive easily fabricated magnetic convergence assembly for cathode ray tubes.

A further object is the provision of a magnetic assembly which does not require specialized jigs or fixtures for its assembly.

Another object is the provision of a magnetic convergence assembly employing integral means for aligning the assembly on the unitized electron gun structure.

Another object is the provision of a magnetic convergence assembly having integral locating means for snubber positioning.

A further object is the provision of simplified positioning and securement means integral to the individual magnetic pole pieces and field shields comprising the magnetic convergence assembly.

A still further object of the invention is to provide an ambi-positional convergence assembly which will compatibly mate in desired alignment with the unitized electron gun structure from either of two possible surfaces.

The foregoing objects are achieved in one embodiment of the invention by the provision of a self-jigging magnetic convergence assembly wherein the magnetic field shields have integral positioning tabs or projections on the upper and lower edges thereof formed to mate with and extend through discrete slots in each of two wafer-like support members thereby providing a basic structural integration. The shield tabs protruding through the support members also provide locating means for the subsequent affixture of snubber positioners to either one of the wafer-like members as desired. The individual pole pieces have integral split tab assembling provisions formed to slide into and project through discrete open-ended slots in each of the two wafer-like members to bind the assembly together and also to facilitate the mating alignment of the terminal electrodes with the beam apertures in either wafer-like member.

For a better understanding of the present invention, together with other and further objects, advantages, and capabilities thereof, reference is made to the following disclosure and appended claims in connection with the accompanying drawings in which:

FIG. 1 is a sectional plan view showing portions of a conventional multi-beam color cathode ray tube embodying features of the invention;

FIG. 2 is a cross-sectional view of the convergence assembly taken along the plane 2—2 of FIG. 1;

FIG. 3 is an exploded view illustrating the self-jigging feature of the invention; and

FIGS. 4 and 5 are perspective views illustrating snubber positioning embodiments of the invention.

With reference to FIG. 1, there are shown partial sections of a typical multi-gun, tri-color, shadow mask cathode ray tube **10** having a neck portion **11**, a foraminous shadow mask **26** and face plate **27** with a tri-color screen **28** disposed on the interior surface thereof. Extending into the neck portion **11** is a skirt of high voltage internal conductive coating **12** which is a continuation of the coating covering the interior surface of the funnel portion of the tube envelope not shown. Encompassed within the neck section **11** is a tri-gun mount structure **13** whereof two of the three individual guns **14** and **14'** are shown. Each of the shown component electron guns has a first grid **15**, a second grid **17**, a third grid **19**, and a fourth grid or terminal accelerating electrode **21** for generating and controlling the beam of electrons emanating therefrom. The several aforementioned grids are held in spaced relationship with respect to each other by means of a plurality of conventional support studs **22** suitably embedded in a plurality of insulative side rods **23** of which two are shown. The convergence assembly **25**, which comprises three pairs of pole pieces **48** suitably shielded to minimize magnetic interaction therebetween, is compatibly mated to the terminal electrodes **21** and thus is oriented intermediate the gun structure **13** and the foraminous shadow mask **26**. It is the function of the convergence assembly **25** to magnetically influence the individual electron beams **24** passing therethrough to achieve the desired convergence of the beams at the apertures **29** of the mask **26** thereby optimizing the subsequent beam landings on the color phosphor dots **30** comprising the screen **28** covering the inside surface of the face plate **27**.

At least three formed snubber means **31**, spacedly located on the top or mask side of the convergence assembly **25**, function to position the gun structure **13** axially in the neck **11** and also to provide electrical connection to the internal high voltage conductive coating **12**. For purposes of clarity only two of such means are shown in FIG. 1.

As illustrated in FIG. 2 the terminal electrodes **21** of the electron gun structure **13** are positioned in proper concentric alignment with respect to the beam apertures **33** of the bottom wafer-like support member **35**. The mated juxtapositional relationship of the terminal electrodes **21** on the magnetic convergence assembly **25** is defined by upstanding portions of the split bottom and top tabs **39** and **39'** integral to the magnetic pole pieces **37** to be subsequently explained in detail. Securement of the convergence assembly to the electrodes **21** is accomplished by bonding the weld tabs **43**, integral to the respective electrodes, to the bottom support member **35** of the assembly.

As detailed in FIGURES 2 and 3, three pairs of spaced magnetic pole pieces **37** are positioned relative to the beam apertures **33** in axial and spatial alignment. Each pole piece may be described as being comprised of two main portions. That portion angularly formed to be associated with the periphery of the assembly is denoted herein as the distal portion **47** and the portion of the pole adjacent the beam passage is designated as the proximal portion **48**. Separating each pair of pole pieces are magnetic field shields **45** positioned on either side and designed to reduce the magnetic field interactions between the individual pairs of pole pieces **37**. As shown, the shielding necessary to separate the three pairs of pole pieces is afforded by two substantially V-shaped winged structures **44** wherein the individual interior angles are substantially 120 degrees. The three shield members **45** are provided by orienting an opposite wing of each winged structure **44** in juxtapositional relationship with the structural apieces **46** being in contiguity. So positioned, the shield structures are oriented in a spaced perpendicular arrangement between the wafer-like bottom support member **35** and the top wafer-like support member **35'**. These two V-shaped members, which are of metal such as nonmagnetic stainless steel, have at least two lower tabs **59** and two upper tabs **59'** projecting in a substantially upstanding manner from the respective edges thereof.

As previously mentioned, the magnetic convergence assembly **25** is mated to the multi-gun mount structure **13** to provide axial alignment of the beam apertures **33** and and **33'** with the respective terminal accelerating electrodes **21** to thereby enhance the desired unrestricted passage of the electron beams **24** during tube operation. Functionally, the pole pieces **37** intercept the lines of magnetic flux emanating from the externally positioned variable field strength magnets **38** and provide a low reluctance path for the lines of flux to be concentrated across the respective gaps **36** between the proximal portions **48** of the pairs of pole pieces **37**. This concentrated field across each of the gaps **36** is utilized to correctively position or divert the electron beams **24** passing between the pole pieces to facilitate convergence of all beams at a shadow mask aperture **29**. The emergence of the beams through aperture **29** from the point of convergence results in the divergence of each beam to strike its specific color dot **30** on screen **28**.

As shown in greater detail in FIG. 3, the bottom support member **35** contains three equispaced beam apertures **33** and a first set of bottom slots **49** and a second set of bottom slots **51**. Each slot of the first set **49** is formed of a substantially longitudinal shape and is substantially radially oriented in the bottom member **35**. Each slot of the second set **51** is of a substantially longitudinal shape having one end opening on the periphery of the bottom member **35** and extending inwardly therefrom substantially toward the center point of the members. As shown, these second set slots are fabricated on an off-radial slant; but depending on the formation of the proximal portions of the pole pieces, they may be of substantially radial orientation. The top support member **35'** is illustrated as being identical to the bottom support member **35** and therefore has top beam apertures **33'** and a first set of top slots **49'** and a second set of top slots **51'** having open peripheral ends identical to and in alignment with corresponding sections of the bottom support member **35**.

Since the several electron guns are conventionally oriented in an angular manner in the gun structure to facilitate convergence of the electron beams, it is essential that the beam apertures **33** and **33'** in the support members **35** and **35'** be of sufficient size to more than accommodate the diameters of the beams passing therethrough. It is not essential to the invention that the bottom and top support members **35** and **35'** be of an identical construction although it is a simplication and an aid to the manufacturing process for them so to be.

The magnetic field shields **45** having lower tabs **59** on the lower edge **61** and the upper tabs **59'** on the upper edge **61'** thereof are inserted through the first set of bottom slots **49** and the first set of top slots **49'** of the respective support members to provide the basic assembly construction into which the magnetic pole pieces **37** are inserted. If desired the tabs **59** and **59'** may be bent partially toward or parallel with the support members **35** and **35'**, and for added securement of the basic structure, the bent tabs may be welded or otherwise bonded thereto.

With reference to the magnetic pole pieces **37**, the split bottom tabs **39** integral to the bottom edge **67** and the split top tabs **39'** integral to the top edge **67'** are insered into the positioned wafer-like support members **35** and **35'** by a substantially lateral sliding engagement into the second set of bottom slots **51** and the second set of top slots **31'**, respectively. It will be noted that the split tabs **39** and **39'** integral to the pole pieces **37** are formed to have two portions each; a substantially upstanding leading **41** and an adjacent trailing portion **42** which is capable of being bent substantially 90 degrees to be flattened against the respective wafer-like member for affixment thereto. To aid in self-jigging the assembly, it is preferable to prebend the trailing portion to an angle sufficient to facilitate structural sustenance during the assembling procedure. It

has been found that an angular prebend of substantially 70 degrees off vertical in a direction opposed to the proximal portion 48 is advantageous for the assembly operation and the subsequent flattening and welding to the respective wafer-like support member. In accordance with the aforedescribed insertion, the upstanding leading portions 41 of the bottom tabs 39 and the upstanding leading portions 41' of the top tabs 39' are moved forwardly to seat at the closed ends of the respective slots such that the proximal portions 48 of the pairs of magnetic pole pieces 37 form a partially closed passage from the bottom apertures 33 through to the top apertures 33' whereby electron beams passing therethrough are magnetically influenced in the corrective manner previously described.

In greater delineation, the bottom and top upstanding leading portions 41 and 41' of the respective split tab structures 39 and 39' form positioning projections having substantially vertical leading edge sections 75 and 75' extending nominal distances from pole edges 67 and 67' with acutely angled receding sections 77 and 77' terminally formed thereon. While not shown, it is evident that these aforementioned receding sections can also be of rounded or arcuate formation. With reference to FIG. 2, it will be noted that the forward portion of each substantially vertical leading edge section 75 and 75' is positioned in a manner to be contiguous to the external periphery of a respective terminal electrode 21. By this means, the three pairs of bottom leading portions 41 are spacedly positioned to effect proper placement of the magnet assembly on the electron gun structure 13. The receding sections 77 and 77', being either angular or arcuate, are utilized in guiding the terminal electrodes 21 into the proper position to nestle snugly against the forward portion of the substantially vertical edges 75 and 75' which are of sufficient height to assure positive placement of the convergence assembly 25 thereupon. In another embodiment not shown, the substantially vertical edges 75 and 75' can be extended the full height of leading portions 41 and 41' without the benefit of receding sections 77 and 77'.

The split tabs 39 and 39' of the magnetic pole pieces 37 are illustrated as being identical, though this is not a necessary requirement of the invention if the magnetic convergence assembly 25 is to be mated to the electron gun structure 13 from the bottom member 35 side only. Ease of assembly and simplification of parts, however, makes it advisable that they be the same. With uniformity of parts and construction, as illustrated in FIG. 3, the convergence assembly 25 can be interchangeably or ambipositionally used whereby the terminal electrodes 21 are mated with either the bottom member 35 or the top member 35' thereby simplifying manufacturing.

The bottom wafer-like support member 35 and the top wafer-like support member 35' are each provided with bosses 79 and 79', respectively. These bosses are spaced from one another and are formed to provide raised portions on both surfaces of the respective support members. During parts processing these bosses 79 and 79' function to keep the individual support members separated from each other and thus prevent them from sticking together. This facilitates adequate cleaning by conventional processes and procedures well known to the art.

In another embodiment of the invention as shown in FIG. 4, the upper tabs 59' on the magnetic field shields 45 are projected through the first set of slots 49' to provide positioning means for locating the snubbers 39 on the top member 35'. The upper tabs 59' are either left upstanding or, if desired, bent parallel to the top member 35' as shown in FIG. 5. In either case, the snubbers 29 are butted against or otherwise located with respect to the tabs 59' thereby insuring uniform radial location on the top member 35'. This placement provides a uniform compressive force to the snubbers 31 upon subsequent insertion of the electron gun structure 13 within the neck 11 of the cathode ray tube thereby promoting desired axial alignment of the gun structure therein.

As aforedescribed, the ambi-positional convergence assembly 25 is a self-jigging unit relying only upon the component parts for ordered positioning and assembly thereof. Furthermore, this versatile convergence assembly 25 is mated by integral means to both the gun structure 13 and the snubbers 31 without the use of additional jigs or fixtures for assemblage. Thus there has been described and illustrated a self-jigging convergence magnet assembly 25 offering ease and simplicity of assembly over conventionally known constructions.

While the invention has been described with reference to a tri-gun color cathode ray tube, it is not intended that the scope of the invention be limited to such.

While there have been shown and described what are at present considered the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

1. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of bottom slots spacedly disposed therein;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots;

a plurality of pairs of magnetic pole pieces each having a plurality of top tabs and bottom tabs integral to the top and bottom edges thereof, said pole pieces being in substantially upstanding relationship to said bottom support member with said bottom tabs mating with said second set of bottom slots; and

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of top slots spacedly disposed therein, said top member being oriented to facilitate the mating of said upper tabs of said magnetic field shields with said first set of top slots and the mating of said top tabs of said magnetic pole pieces with said second set of top slots to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

2. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of bottom slots spacedly disposed therein, said bottom member having a plurality of spaced bosses formed to provide raised portions in both surfaces thereof;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the

upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots;

a plurality of pairs of magnetic pole pieces each having a plurality of top tabs and bottom tabs integral to the top and bottom edges thereof, said pole pieces being in substantially upstanding relationship to said bottom support member with said bottom tabs mating with said second set of bottom slots; and

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of top slots spacedly disposed therein and a plurality of spaced bosses formed to provide raised portions on both surfaces thereof, said top member being oriented to facilitate the mating of said upper tabs of said magnetic field shields with said first set of top slots and the mating of said top tabs of said magnetic pole pieces with said second set of top slots to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

3. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of bottom slots spacedly disposed therein;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof, each of said pole pieces being in subsantially upstanding relationship to said bottom support member with said split bottom tabs mating with said second set of bottom slots; and

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of top slots spacedly disposed therein, said top member being oriented to facilitate the mating of said upper tabs of said magnetic field shields with said first set of top slots and the mating of said split top tabs of said magnetic pole pieces with said second set of top slots to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

4. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal bottom slots spacedly disposed therein, said first set of bottom slots being substantially radially oriented in said bottom member and said second set of bottom slots each having an open end of the periphery of said member;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof with each of said split top and split bottom tabs having an upstanding leading portion and an adjacent trailing bent portion, said pole pieces being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating in sliding engagement with said second set of bottom slots and projecting therethrough with said bottom tab trailing bent portions providing securement to said bottom support member, said bottom tab upstanding leading portions providing a plurality of positioning projections for locating said terminal electrodes with respect to said beam apertures in said bottom support member;

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal top slots spacedly disposed therein, said first set of top slots being substantially radially oriented in said top support member, and said second set of top slots each having an open end on the periphery of said member, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough, said split top tabs of said magnetic pole pieces mating with said second set of top slots and projecting therethrough with said top tab trailing bent portions providing securement to said top support member to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

5. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal bottom slots spacedly disposed therein, said first set of bottom slots being substantially radially oriented in said bottom member and said second set of bottom slots each having an open end on the periphery of said member;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof with each of said split top and split bottom tabs having an upstanding leading portion and an adjacent trailing portion capable of being bent, said pole pieces

being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating in sliding engagement with said second set of bottom slots and projecting therethrough with said bottom tab trailing portions providing securement to said bottom support member, said bottom tab upstanding leading portions providing a plurality of positioning projections for locating said terminal electrodes with respect to said beam apertures in said bottom support member;

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal top slots spacedly disposed therein, said first set of top slots being substantially radially oriented in said top support member, and said second set of top slots each having an open end on the periphery of said member, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough, said split top tabs of said magnetic pole pieces mating with said second set of top slots and projecting therethrough with said top tab trailing portions providing securement to said top support member to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

6. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal bottom slots spacedly disposed therein, said first set of bottom slots being substantially radially oriented in said bottom member and said second set of bottom slots each having an open end on the periphery of said member and extending substantially inwardly therefrom;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationsiip to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof with each of said split top and split bottom tabs having an upsanding leading portion and an adjacent trailing bent portion, each of said leading portions having a substantially vertical leading edge section, said pole pieces being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating in sliding engagement with said second set of bottom slots and projecting therethrough with said bottom tab trailing bent portions providing securement to said bottom support member, said bottom tab upstanding leading portions providing a plurality of positioning projections for locating said terminal electrodes with respect to said beam apertures in said bottom support member;

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal top slots spacedly disposed therein, said first set of top slots being substantially radially oriented in said top support member, and said second set of top slots each having an open end on the periphery of said member and extending substantially inwardly therefrom, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough, said split top tabs of said magnetic poles pieces mating in sliding engagement with said second set of top slots and projecting therethrough with said top tab trailing bent portions providing securement to said top support member to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned there-between tao provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

7. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal bottom slots spacedly disposed therein, said first set of bottom slots being substantially radially oriented in said bottom member and said second set of bottom slots each having an open end on the periphery of said member and extending substantially inwardly therefrom;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof with each of said split top and split bottom tabs having an upstanding leading portion and an adjacent trailing bent portion, each of said leading portions having a substantially vertical leading edge section terminated by an acutely angled receding section, said pole pieces being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating in sliding engagement with said second set of bottom slots and projecting therethrough with said bottom tab trailing bent portions providing securement to said bottom support member, said bottom tab upstanding leading portions providing a plurality of positioning projections for locating said terminal electrodes with respect to said beam apertures in said bottom support member;

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal top slots spacedly disposed therein, said first set of top slots being substantially radially oriented in said top support member, and said second set of top slots each having an open end on the periphery of said member and extending substantially inwardly therefrom, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough, said split top tabs of said magnetic pole pieces mating in sliding engagement with said second set of top slots and projecting therethrough with said top tab trailing bent portions providing securement to said top support member to form an integrated convergence assembly wherein the individual beam apertures in

said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

8. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal bottom slots spacedly disposed therein, said first set of bottom slots being substantially radially oriented in said bottom member and said second set of bottom slots each having an open end on the periphery of said member and extending substantially inwardly therefrom;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof with each of said split top and split bottom tabs having an upstanding leading portion and an adjacent trailing bent portion, each of said leading portions having a substantially vertical leading edge section terminated by an arcuately formed receding section, said pole pieces being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating in sliding engagement with said second set of bottom slots and projecting therethrough with said bottom tab trailing bent portions providing securement to said bottom support member, said bottom tab upstanding leading portions providing a plurality of positioning projections for locating said terminal electrodes with respect to said beam apertures in said bottom support member;

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of substantially longitudinal top slots spacedly disposed therein, said first set of top slots being substantially radially oriented in said top support member, and said second set of top slots each having an open end on the periphery of said member and extending substantially inwardly therefrom, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough, said split top tabs of said magnetic pole pieces mating in sliding engagement with said second set of top slots and projecting therethrough with said top tab trailing bent portions providing securement to said top support member to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

9. In a cathode ray tube having a plural gun structure formed to project a plurality of electron beams through an apertured mask onto an electron responsive screen adjacent thereto, a self-jigging magnetic convergence assembly adapted for compatible juncture with snubber means and the terminal electrodes of the gun structure comprising:

a bottom wafer-like support member having a plurality of beam apertures and a first set and a second set of bottom slots spacedly disposed therein;

a plurality of magnetic field shields each having a plurality of upper tabs and lower tabs integral to the upper and lower edges thereof, said shields being in substantially upstanding relationship to said bottom support member with said lower tabs mating with said first set of bottom slots and projecting therethrough;

a plurality of pairs of magnetic pole pieces each having a plurality of split top tabs and split bottom tabs integral to the top and bottom edges thereof, each of said pole pieces being in substantially upstanding relationship to said bottom support member with said split bottom tabs mating with said second set of bottom slots and projecting therethrough; and

a top wafer-like support member having a plurality of beam apertures and a first set and a second set of top slots spacedly disposed therein, said upper tabs of said magnetic field shields mating with said first set of top slots and projecting therethrough to provide means for locating said snubbers on said top support member, said split top tabs of said magnetic pole pieces mating with said second set of top slots and projecting therethrough to form an integrated convergence assembly wherein the individual beam apertures in said top and bottom support members are in alignment with respective pairs of said pole pieces positioned therebetween to provide unrestricted passages for said electron beams therethrough, said individual pairs of pole pieces being spacedly separated by said magnetic field shields to minimize magnetic interaction between said beams.

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