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[54] **ELECTRON GUN ASSEMBLY WITH FLEXIBLE ELECTRICAL INTERCONNECTION FOR CORRESPONDING ELECTRODES AND METHOD OF FABRICATING SAME**

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[52] **U.S. Cl.** **313/409,** 29/25.13, 313/256, 313/417

[51] **Int. Cl.** **H01j 29/50,** H01j 29/02

[58] **Field of Search** .. 313/69 C, 70 C, 82 R, 82 BF, 313/256; 29/25.13, 25.15

[56] **References Cited**

UNITED STATES PATENTS

3,268,753	8/1966	Hughes	313/69
3,389,284	6/1968	Andrews	313/70 C
3,603,829	9/1971	Tsuneta et al.	313/70 C
3,659,133	4/1972	Tsuneta et al.	313/70 C
3,745,397	7/1973	Yamazaki et al.	313/70 C

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[57] **ABSTRACT**

Corresponding electrodes in each respective electron gun of a triple electron gun color television picture tube are interconnected by welding so as to electrically couple a light metallic ribbon tab to each such corresponding electrode prior to glassing. This allows glassing without need for disturbing gun alignment by making welded connections after glassing. Weld burrs and sharp corners are thereby spaced at sufficient distance from the tube neck to reduce likelihood of arcing therefrom to the neck.

15 Claims, 7 Drawing Figures

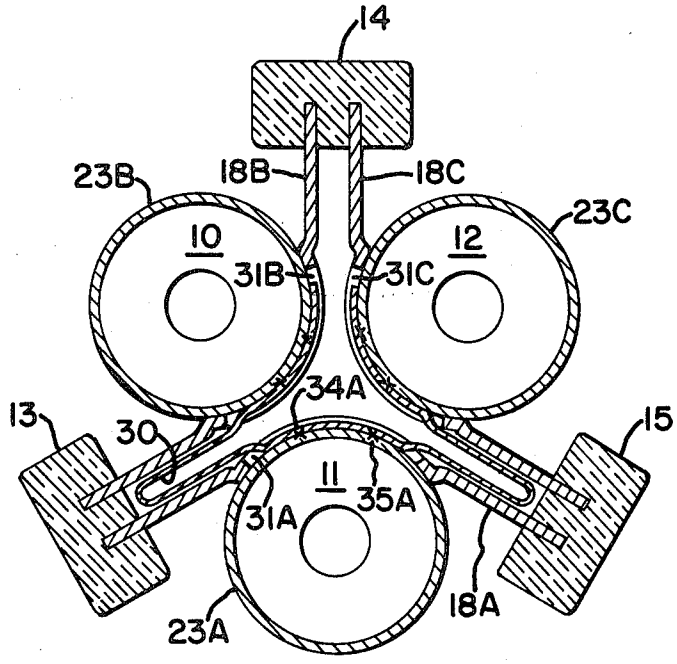


FIG.1

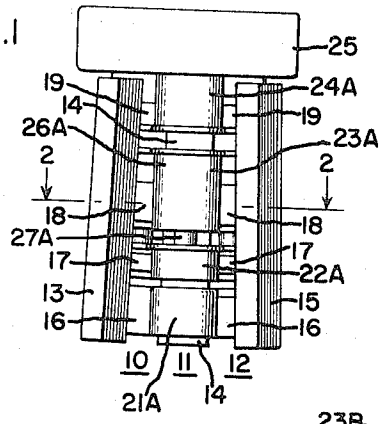


FIG.2A
(PRIOR ART)

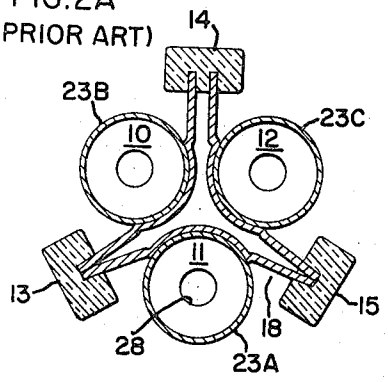


FIG.2B

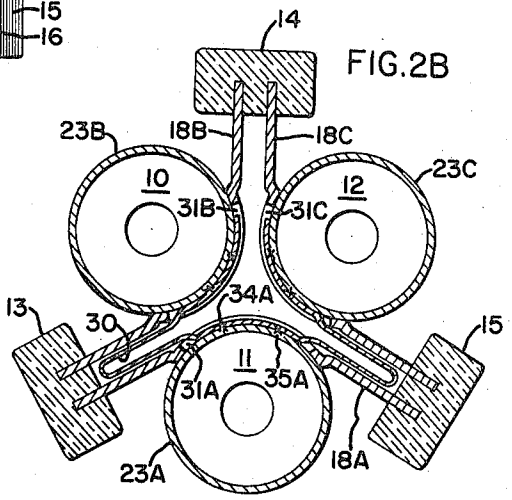


FIG.3

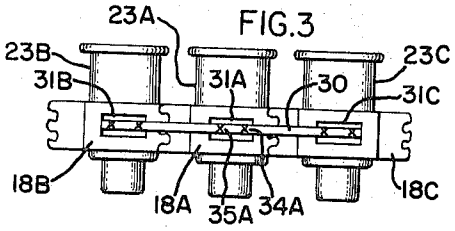


FIG.4

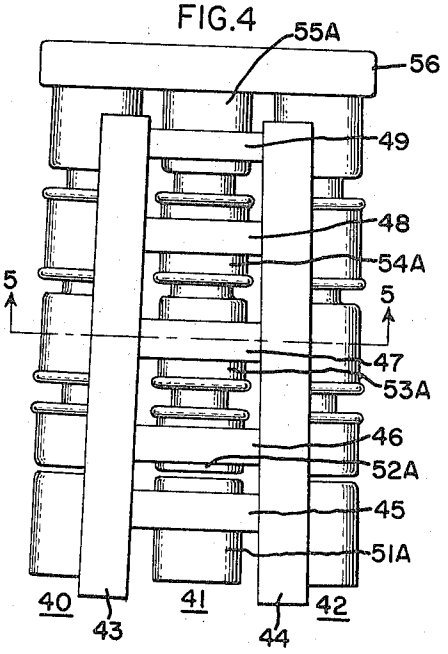


FIG.5

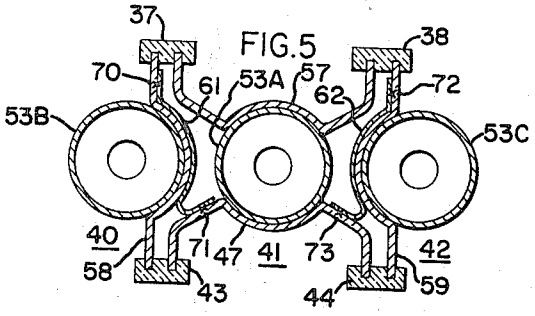
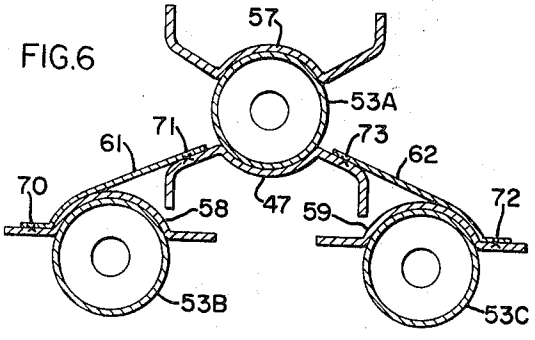


FIG.6



ELECTRON GUN ASSEMBLY WITH FLEXIBLE ELECTRICAL INTERCONNECTION FOR CORRESPONDING ELECTRODES AND METHOD OF FABRICATING SAME

This invention relates to triple electron guns for color television picture tubes, and more particularly to a method and apparatus for electrically interconnecting corresponding electrodes in each respective electron gun thereof.

In typical triple electron gun assemblies for color television picture tubes, whether such assemblies are of delta or inline configuration, the second accelerating electrodes of the electron guns, also known as G3 electrodes or first anodes, are electrically interconnected in order to provide the electron guns with uniform electrical performance necessary in displaying proper color images. In some tubes, the final accelerating electrodes of the electron guns, also known as G4 electrodes, and which serve to focus the electron beam emerging from the G3 electrodes, respectively, in any given electron gun, are also electrically interconnected in order to provide the guns with uniform electrical characteristics.

Electrical interconnection of corresponding electrodes in each respective electron gun of a triple electron gun television picture tube has heretofore commonly been achieved by welding a metallic tab to all three electrodes after glassing; i.e., after the electrodes of all three guns have been fixed in position. This requires elaborate procedures to minimize changes in gun alignment caused by the electrodes being inadvertently moved out of position due to stresses occuring during the welding operation. In addition, it has been found that weld burrs and sharp edges, which occur near the outermost locations of the triple electron gun structure, are likely to give rise to arcing to the tube neck, thereby rendering the tube inoperative.

In an effort to overcome these problems, it has previously been proposed, for delta electron gun assembly configurations, to interconnect corresponding electrodes of each respective electron gun with a contact strip of resilient metal spot-welded at its center to the support member for the desired electrode in one of the electron guns, and allow each end of the contact strip to make electrical contact with the desired electrode, respectively, in each of the other two guns by pressure against the support members resulting from the resilient nature of the contact strip. The difficulty with this type of connection, however, is that contact requiring pressure is not completely reliable, that is, if pressure should slacken for any reason, the contact may open. Slackening of pressure may occur if the contact strip is flexed during assembly. Additionally, welding of the strip at its center results in some heat-induced deformation of the strip and a softening which reduces resilience in the region of the weld. Moreover, should the support member or contact strip be dirty or oxidized at the location of contact therebetween, a pressure contact may fail to lower resistance between the strip and support member to the necessary level. Performance of a tube containing an electron gun assembly with significant resistance between corresponding electrodes of the respective electron guns would be degraded.

The present invention obviates the aforementioned difficulties by employing a light metallic ribbon tab that

is welded to support structure of a corresponding electrode in each electron gun, respectively, so as to electrically interconnect the electrodes reliably. Because the welding operation is performed prior to glassing, electrode alignment is not disturbed after being established by glassing. Moreover, weld burrs and sharp corners are kept sufficiently separated from the tube neck as to reduce likelihood of arcing from such burrs or corners to the tube neck when the tube is operated at rated voltages.

Accordingly, one object of the invention is to electrically interconnect corresponding electrodes of each respective electron gun in a triple electron gun assembly of a color television picture tube without shifting axial alignment or spacings of the electrodes.

Another object is to make reliable electrical interconnection of corresponding electrodes of each respective electron gun in a triple electron gun assembly of a color television picture tube while minimizing likelihood of arcing from weld burrs or sharp corners to the tube neck.

Another object is to provide a method of electrically interconnecting corresponding electrodes of each respective electron gun in a triple electron gun assembly of a color television picture tube prior to affixing the electrodes in place by glassing.

Briefly, in accordance with a preferred embodiment of the invention, a plural electron gun assembly for a color television picture tube comprises first, second and third electron guns, each electron gun respectively including corresponding electrodes. Support means are joined to each corresponding electrode along a predetermined portion of its periphery, respectively, in each respective electron gun so as to form a rigid structure therewith in the respective electron gun. A flexible metallic tab is welded to the rigid support structure in each electron gun so as to be electrically coupled to each of the corresponding electrodes at a location, respectively, within the predetermined portion of its periphery, respectively.

In accordance with another preferred embodiment of the invention, a method for electrically interconnecting corresponding electrodes of separate electron guns in a plural electron gun assembly for a color television picture tube comprises welding a separate member to each corresponding electrode to be assembled into a separate electron gun, respectively, so as to form separate rigid structures, respectively. A flexible metallic tab is welded to the separate rigid structures, and the structures are arranged at locations at which they are to be permanently situated. The support members are then glassed so as to be retained rigidly in place.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the invention believed to be novel are set forth with particularity in the appended claims. The invention itself, however, both as to organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompany drawings in which:

FIG. 1 is an illustration of the electrodes employed in a typical electron gun assembly of delta configuration for a color television picture tube;

FIG. 2A is a sectional view of corresponding electrodes in each of the electron guns of FIG. 1, as viewed along line 2—2 of FIG. 1, wherein the electrodes are

electrically connected in a manner known to the prior art;

FIG. 2B is a sectional view of corresponding electrodes in each of the electron guns of FIG. 1, as viewed long line 2—2 of FIG. 1, wherein the electrodes are electrically connected in a manner according to the instant invention;

FIG. 3 is a side view of corresponding electrodes in each of the electron guns of FIG. 1, electrically interconnected in the manner shown in FIG. 2B, prior to their being arranged in position for glassing,

FIG. 4 is an illustration of the electrodes employed in a typical electron gun assembly of inline configuration for a color television picture tube;

FIG. 5 is a sectional view of corresponding electrodes in each of the electron guns of FIG. 4, as viewed along line 5—5 in FIG. 4, and

FIG. 6 is a sectional view of the corresponding electrodes of FIG. 5 prior to their being arranged in position for glassing.

DESCRIPTION OF TYPICAL EMBODIMENTS

In FIG. 1, the electrodes of a typical triple electron gun assembly of delta configuration are illustrated. The assembly comprises electron guns **10, 11** and **12** having longitudinal axes situated at respective vertices of an equilateral triangle, as is known in the art. Each of electron guns **10, 11** and **12** is made up of a plurality of electrodes maintained rigidly in place by support means comprising beads **13, 14** and **15,** and support straps such as straps **16, 17, 18** and **19** which are visible in FIG. 1 and are held by beads **13** and **15.** The beads are typically comprised of glass which, when softened by heating, accepts insertion of the ends of the support straps, typically comprised of stainless steel. Upon cooling, the beads adhere to the straps, thereby retaining them in place.

In the triple electron gun assembly of FIG. 1, the guns each have essentially identical electrode structure. Thus, each electron gun, as exemplified by electron gun **11,** is comprised of a control grid **21A** in which is contained a cathode assembly (not shown), a second or screen grid **22A,** an accelerating anode **23A** and a final anode **24A.** The final anode of each of guns **10, 11** and **12** is joined to a convergence assembly **25.** Each of the aforementioned electrodes and convergence assembly is typically comprised of stainless steel. In order to provide an electric field of proper configuration to accelerate electrons and form the beams, the accelerating anode may each be comprised of a large diameter section **26A** and a smaller diameter section **27A** which extends into screen grid **22A.**

In producing an electron beam in each of electron guns **10, 11** and **12,** electrons generated by the cathode contained in control grid **21A** are passed through the control grid at a rate determined by amplitude of negative voltage on the control grid. Screen grid **22A,** operated at low positive potential, attracts electrons passed through control grid **21A** so as to produce a slightly divergent directional electron flow, or an electron beam. Accelerating anode **23A,** operated at high positive potential, accelerates electrons from screen grid **22A** to higher velocity. Final anode **24A** interacts with accelerating anode **23A** in order to focus the electron beam to a very fine spot on the screen (not shown) of the cathode ray tube (not shown) containing the apparatus. Final anode **24A** is typically maintained at higher positive potential than accelerating anode **23A,** thereby providing so-called bipotential focusing for the electron gun. Electrons emerge from final anode **24A** at a velocity sufficiently high to excite phosphors of any given type on the screen, causing the phosphors to produce light.

In the triple electron gun assembly illustrated in FIG. 1, not only is each of electron guns **10** and **12** comprised of the same type elements that comprise gun **11,** but corresponding G3 and G4 electrodes of each electron gun are operated at the same potential, respectively. Interconnections to achieve this result are well known to the prior art. Thus, FIG. 2A, which is a cross sectional view of a prior art embodiment of the accelerating anodes taken along line 2—2 of FIG. 1, shows accelerating anode **23A** along with corresponding accelerating anodes **23B** and **23C** of each of electron guns **10** and **12,** respectively, having a single, metallic support strap **18** welded to the circular sides of each of the accelerating anodes. In this way, the accelerating anodes are electrically interconnected. Openings in the electrodes, such as aperture **28** in electrode **23A,** permit passage of the electron beam through each gun.

Although satisfactory electrical interconnections have previously been made according to the structure of FIG. 2A, it is difficult to manufacture triple electron gun assemblies with this type of interconnection. This is because the support strap must be welded to all three electrodes prior to glassing (i.e., joining of the support strap to the beads) in order to gain access to the proper regions of the electrodes to be welded to the support strap. After the welds have been made, it is difficult to stack the electrodes properly against spacers on mandrels for the glassing operation. The electrodes must be in very precise alignment for successful operation of an electron gun. However, the rigidity of the support strap makes it difficult properly to position or align the electrodes for glassing.

To overcome the positioning and alignment problems encountered when apparatus of the type shown in FIG. 2A is assembled, it has been proposed in the prior art to employ a separate support strap welded to each corresponding electrode, respectively, of an electron gun, together with a resilient, stainless steel ribbon welded to one of the support straps at the region where the one support strap is welded to an electrode, with each end of the ribbon allowed to contact an end of each of the other two support straps, respectively. The contact at each end of the ribbon, therefore, is a pressure contact, which depends upon resilience of the ribbon to insure sufficient pressure against the support straps to make good electrical contact. This construction results in the ribbon being situated within a region enclosed by the support strap, so that the ends of the ribbon at which high voltage gradients occur are isolated from the neck of the tube containing the triple electron gun assembly and are therefore less likely to support electrical arcing to the tube neck. However, apparatus of this type has potential shortcomings of its own because of its dependence upon its own resilience to achieve electrical contact. These shortcomings have been described, supra.

In order to achieve reliable electrical interconnection of corresponding electrodes in delta gun assemblies, together with reduced likelihood of arcing to the tube neck, and without adversely affecting electrode positioning or alignment, the apparatus of FIG. 2B has been

invented. The invention employs separate straps **18A**, **18B** and **18C**, instead of a single, welded strap **18** as in the embodiment of FIG. **2A**. Straps **18A**, **18B** and **18C**, conveniently comprised of stainless steel, are welded to electrodes **23A**, **23B** and **23C**, respectively, so as to form separate rigid structures, respectively. A light ribbon metal tab **30**, typically comprised of stainless steel, is welded to each of electrodes **23A**, **23B** and **23C** through openings **31A**, **31B** and **31C** in straps **18A**, **18B** and **18C**, respectively, thereby electrically interconnecting electrodes **23A**, **23B** and **23C**. Each opening is preferably centered about the closest point on the periphery of a respective electrode that is substantially equidistant from the corresponding electrodes of the other two guns.

Typical dimensions for metal tab **30** are 1.450 inches by 0.040 inches, and 0.005 inches in thickness. In the manner described in conjunction with FIG. **3**, two spot welds are made through each of openings **31A**, **31B** and **31C** to electrodes **23A**, **23B** and **23C**, respectively, such as welds **34A** and **35A** to electrode **23A**, in order to weld ribbon tab **30** to each of electrodes **23A**, **23B** and **23C**. It can be seen that this type of electrical connection overcomes the positioning and alignment difficulties encountered when the apparatus of FIG. **2A** is assembled, without any significant increase in likelihood of arcing to the tube neck and without the disadvantages of relying upon resilience of the ribbon to provide sufficient pressure to achieve electrical contact. Moreover, by employing a new method of fabrication as described herein, manufacture of more precise triple electron gun assemblies can be greatly facilitated.

FIG. **3** illustrates a key step in fabricating the triple electron gun assembly of delta configuration according to the teachings of the invention. Electrodes **23A**, **23B** and **23C**, each with a support strap **18A**, **18B** and **18C**, respectively, welded to it, are aligned so that openings **31A**, **31B** and **31C** all face in one general direction. Flexible tab **30** is thereupon welded to each of electrodes **23A**, **23B** and **23C** through openings **31A**, **31B** and **31C**, respectively, as shown. This may be accomplished by two spot welds through each opening, as exemplified by welds **34A** and **35A** to electrode **23A**. Thereafter, tab **30** is bent into the configuration illustrated in FIG. **2B** to permit glassing.

FIG. **4** illustrates the electrodes of a typical triple electron gun assembly of inline configuration. The assembly comprises electron guns **40, 41** and **42** having coplanar longitudinal axes, as is known in the art. Each of electron guns **40, 41** and **42** is made up of a plurality of electrodes maintained rigidly in place by support means comprising four beads, two of which, **43** and **44** are shown, along with support straps, such as straps **45, 46, 47, 48** and **49** held by beads **43** and **44.** As in the case of the delta-configured electron gun assembly, each bead is typically comprised of glass which, when softened by heating, accepts insertion of the support straps, typically comprised of stainless steel, and, upon cooling, adheres to the straps to retain them in place.

In the electron gun assembly of FIG. **4**, the electrode structure of each of the electron guns is essentially identical. Thus, each electron gun, as exemplified by electron gun **41**, is comprised of a control grid **51A** in which is contained a cathode assembly (not shown), a second or screen grid **52A**, an accelerating anode **53A**, a focus electrode **54A** and a final anode **55A**. The final anode of each of guns **40, 41** and **42** is joined to a convergence assembly **56.** In order to provide an electric field of proper configuration to controllably accelerate electrons, accelerating anode **53A** may be comprised of a large diameter section and two smaller diameter sections which extend into screen grid **52A** and focus electrode **54A**, respectively. An accelerating anode of this type is described and claimed in E. M. Krackhardt application Ser. No. 359,134, filed May 10, 1973, and assigned to the instant assignee.

The electrode elements of the triple electron gun assembly shown in FIG. **4** function in a manner similar to that described for the electrode elements in the apparatus of FIG. **1.** The functioning of each of control grid **51A**, screen grid **52A** and accelerating anode **53A** is identical to that described for each of control grid **21A**, screen grid **22A** and accelerating anode **23A**, respectively, in the apparatus of FIG. **1.** Additionally, in the assembly of FIG. **4**, focus electrode **54A** interacts with first anode **53A** and second or final anode **55A** in order to focus the electron beam to a very fine spot. First anode **53A** and second anode **55A** are typically maintained at a common positive potential, with respect to focus electrode **54A**, which may be at ground potential, thereby providing so-called unipotential focusing for the electron gun. Electrons emerge from second anode **55A** at a velocity sufficiently high to excite phosphors of any appropriate type on the screen of the cathode ray tube in which the electron gun assembly is contained, causing the phosphors to produce light.

In the triple electron gun assembly illustrated in FIG. **4**, not only is each of electron guns **40** and **42** comprised of the same type elements that comprise gun **41**, but corresponding accelerating anodes, focus electrodes, and final anodes of each electron gun are operated at the same respective potential. Interconnections to achieve this result are well known in the art, but have been less than satisfatory in that they either employed support straps welded together at the bead, thereby exhibiting disadvantages of the type described for the delta electron gun assembly of FIG. **2A**, or alternatively employed metallic ribbon connections situated externally to the region bounded by the support strap so as to suffer from excessive arcing to the tube neck.

To make reliable electrical interconnection of corresponding electrodes in each respective electron gun without adversely affecting electrode positioning or alignment in inline electron gun assemblies, the apparatus of FIG. **6** has been invented. In FIG. **5**, which is a cross sectional view of the accelerating anodes taken along line **5—5** of FIG. **4**, accelerating anode **53A** is shown with corresponding accelerating anodes **53B** and **53C** of each of electron guns **40** and **42**, respectively, having an electrode support structure of the type described and claimed in Doggett, et al., application Ser. No. 332,338, filed Feb. 14, 1973 as a continuation of abandoned application Ser. No. 731,807, filed May 24, 1968, and assigned to the instant assignee. Straps **47** and **57** are welded to opposite sides of the circular surface of electrode **53A** to form a rigid structure therewith, while a strap **58** is welded to the circular surface of electrode **53B** in electron gun **40** to form a rigid structure therewith and a strap **59** is welded to the circular surface of electrode **53C** in electron gun **42** to form a rigid structure therewith. The ends of the straps are positioned for imbedding into appropriate ones of beads **37, 38, 43** and **44.**

In order to interconnect electrodes 53A and 53B electrically, a flexible metallic ribbon 61 is spot welded to suport strap 58 at location 70 and to support strap 47 at location 71. Similarly, electrodes 53A and 53C are electrically interconnected by a flexible metallic ribbon 62 spot welded to support strap 59 at location 72 and to support strap 47 at location 73. In the manner described in conjunction with FIG. 6, spot welds 70, 71, 72 and 73 are made at locations outside the regions where a support strap makes contact with an electrode.

A key step in fabricating the assembly of FIG. 5 is illustrated in FIG. 6, wherein the electrodes of FIG. 5 are shown welded to their support straps and electrically interconnected, prior to being situated in a glassing fixture for being fixed into position. Arrangement of the electrodes and the support straps in this fashion facilitates spot welding of tabs 61 and 62 to the support straps, and also permits precise positioning of the electrodes in the glassing fixture prior to glassing, thereby eliminating a major cause of misalignment of electron guns and mispositioning of electrodes therein. The length of each metallic ribbon tab is sufficient to allow reasonable freedom of relative movement between corresponding electrodes electrically connected thereby in the respective electron guns.

The foregoing describes a triple electron gun assembly of a color television picture tube wherein corresponding electrodes of the respective electron guns are electrically interconnected without shifting axial alignment of the electrodes. Although the invention has been described predominantly in terms of interconnecting the accelerating anodes of the respective electron guns, other electrodes such as the focus electrode of a unipotential electron gun assembly or the final anode of a bipotential electron gun assembly (where the final anodes are not connected to the convergence assembly or cup) may similarly be interconnected according to the invention. A method of electrically interconnecting corresponding electrodes of a triple electron gun assembly of a color television picture tube prior to affixing the electrodes in place by glassing is also described, and results in reliable electrical interconnection of corresponding electrodes of the respective electron guns while minimizing likelihood of arcing from weld burrs or sharp corners to the tube neck.

While only certain preferred features of the invention have been shown by way of illustration, many modifications and changes will occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

I claim:

1. A plural electron gun assembly for a color television picture tube comprising:
- first, second and third electron guns, each electron gun respectively including corresponding electrodes of substantially circular cross section;
- support means joined to a corresponding electrode along a predetermined portion of its periphery, respectively, in each respective electron gun so as to form a rigid structure therewith in said respective electron gun, and
- flexible metallic tab means welded to said structure in each electron gun, said tab means being electrically coupled to each of said corresponding electrodes at a location, respectively, within said predetermined portion of its periphery, respectively.

2. The apparatus of claim 1 wherein said tab means is welded directly to each of said corresponding electrodes.

3. The apparatus of claim 1 wherein said electron guns are arranged in a delta configuration, said predetermined portion of the periphery of each electron gun being centered about a point on said periphery substantially equidistant from the other two electron guns.

4. The apparatus of claim 3 wherein said tab means is welded directly to each of said corresponding electrodes.

5. The apparatus of claim 3 wherein said point is the closest point on said periphery that is substantially equidistant from said other two electron guns.

6. The apparatus of claim 5 wherein said tab means is welded directly to each of said corresponding electrodes.

7. A plural electron gun assembly for a color television picture tube comprising:
- first, second and third electron guns, each electron gun respectively including corresponding electrodes;
- support means joined to a corresponding electrode in each respective electron gun, said support means containing an opening in a region contiguous with each of said electrodes, respectively; and
- a flexible metallic tab welded to said corresponding electrode in each gun through said opening, said tab electrically interconnecting said corresponding electrodes.

8. The apparatus of claim 7 wherein said electron guns are arranged in a delta configuration, said region contiguous with any one of said electrodes being centered about the closest point on the periphery of said one of said electrodes that is substantially equidistant from the other two of said electrodes.

9. A plural electron gun assembly for a color television picture tube comprising:
- first, second and third electron guns having coplanar longitudinal axes, each electron gun respectively including corresponding electrodes;
- support means joined to a corresponding electrode along a predetermined portion of said electrode in each respective electron gun so as to form a rigid structure therewith in said respective electron gun;
- a first flexible metallic tab welded to said structure at each of said first and second electron guns; and
- a second flexible metallic tab welded to said structure at each of said second and third electron guns.

10. The apparatus of claim 9 wherein said first flexible metallic tab is welded to said support means for corresponding electrodes in said first and second electron guns at locations outside those where said support means is joined to the predetermined portions of the corresponding electrodes in said first and second electron guns, and said second flexible metallic tab is welded to said support means for corresponding electrodes in said second and third electron guns at locations outside those where said support means is joined to the predetermined portions of the corresponding electrodes in said second and third electron guns.

11. In a plural electron gun assembly for a color television picture tube, apparatus for electrically intercon-

necting corresponding electrodes of each respective electron gun comprising:

support means welded to a corresponding electrode in each respective electron gun, said support means containing an opening therein in a region contiguous with each of said electrodes, respectively; and

a flexible metallic tab welded to, and electrically interconnecting, said corresponding electrode in each respective electron gun through said opening.

12. A method for electrically interconnecting corresponding electrodes of separate electron guns in a plural electron gun assembly for a color television picture tube, comprising:

welding a separate support member to each corresponding electrode to be assembled into a separate electron gun, respectively, so as to form separate rigid structures, respectively;

welding a flexible metallic tab to said separate rigid structures;

arranging said separate rigid structures at locations at which said structures are to be permanently situated; and

glassing the support members to retain said members rigidly in place.

13. The method of claim **12** wherein said tab is welded to said each corresponding electrode.

14. A method for electrically interconnecting corresponding electrodes of three separate electron guns in an electron gun assembly for a color television picture tube comprising:

joining a separate support member to each corresponding electrode to be assembled into a separate electron gun, respectively, so as to form first, second and third separate rigid structures with first, second and third corresponding electrodes, respectively;

welding a first flexible metallic tab to said first and second rigid structures;

welding a second flexible metallic tab to said second and third rigid structures;

arranging said separate rigid structures at locations where said structures are to be permanently situated; and

glassing said support members to retain said members rigidly in place.

15. The method of claim **14** wherein said first tab is welded to the support members joined to said first and second corresponding electrodes, and said second tab is welded to the support members joined to said second and third corresponding electrodes.

* * * * *