United States Patent

Arrington et al.

[15] **3,671,903**

[45] **June 20, 1972**

[54] NON-INFLAMMABLE HORIZONTAL OUTPUT TRANSFORMER

[72] Inventors: **William L. Arrington; Wayne Carlton Gantt,** both of Batavia; **Leonard Joseph Gouger,** Albion, all of N.Y.

[73] Assignee: **GTE Synvania Incorporated**

[22] Filed: **Feb. 8, 1971**

[21] Appl. No.: **113,463**

[52] **U.S. Cl.**.....**336/96,** 336/192, 336/197, 336/210

[51] **Int. Cl.**.....**H01f 27/26,** H01f 27/30

[58] **Field of Search**.....336/96, 198, 208, 192, 210, 336/197, 205, 65

[56] **References Cited**

UNITED STATES PATENTS

3,533,036	10/1970	Wood	336/96
3,569,885	3/1971	Hilgers	336/96
2,731,607	1/1956	Gould et al.	336/96
2,956,250	10/1960	Harse	336/210 X
3,227,981	1/1966	Krepps, Jr. et al.	336/192
2,612,545	9/1952	Gray	336/210 X
3,408,605	10/1968	Hughes et al.	336/96
2,930,013	3/1960	Bruch	336/210 X
2,988,715	6/1961	Gizynski et al.	336/96
1,768,950	7/1930	Frank	336/197

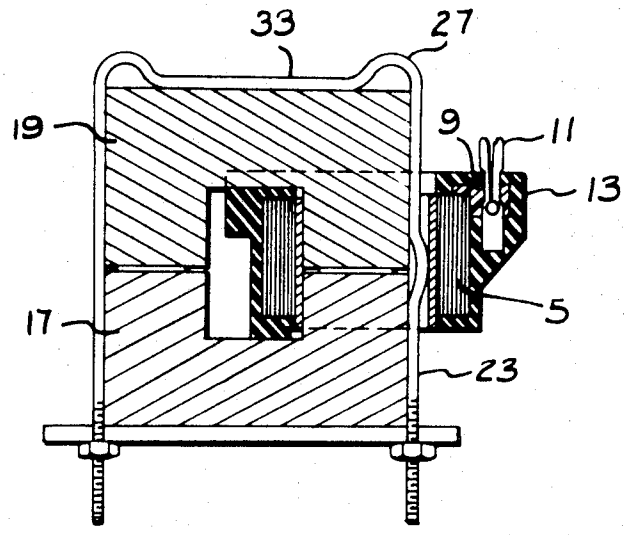
Primary Examiner—Thomas J. Kozma

Attorney—Norman J. O'Malley, Robert E. Walrath and Thomas H. Buffton

[57] **ABSTRACT**

A non-inflammable horizontal output transformer includes a coil member having a plurality of leads extending therefrom, an arcuate ring member affixed to the coil member with a plurality of contact pins extending outwardly therefrom and connected to the leads, an envelope of non-inflammable material surrounding the coil member, ring member, and leads and the coil member supported by a hollow insulator telescoped over a pair of confronting leg members of a pair of U-shaped core members positionally held by a U-shaped wire member.

4 Claims, 3 Drawing Figures



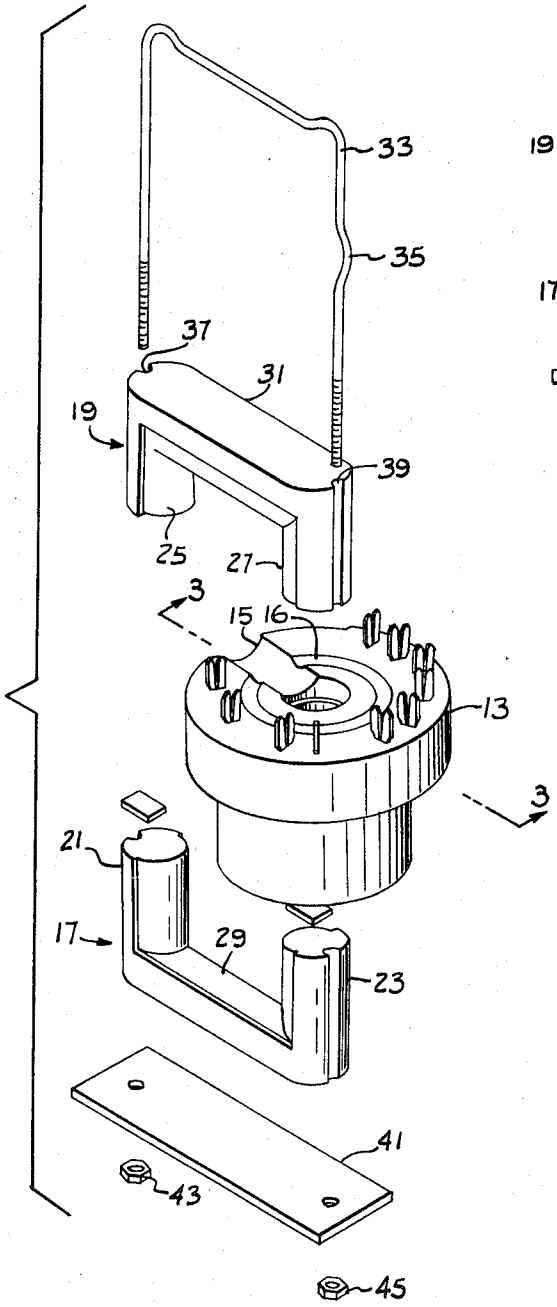


Fig. 2

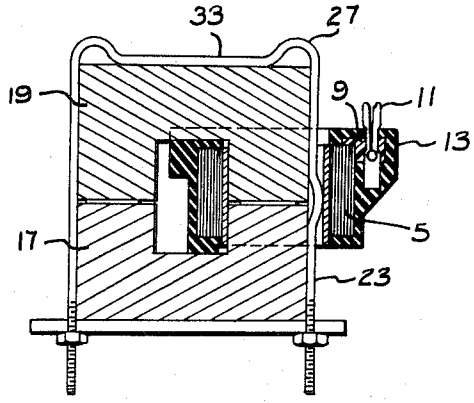


Fig. 3

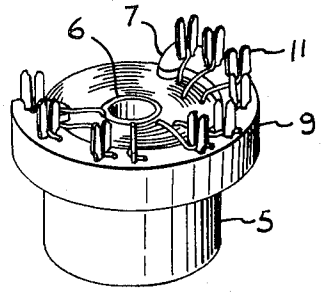


Fig. 1

INVENTORS.
WILLIAM L. ARRINGTON,
WAYNE C. GANTT, &
LEONARD J. GOUGER

BY Robert E. Walrath
ATTORNEY

NON-INFLAMMABLE HORIZONTAL OUTPUT TRANSFORMER

BACKGROUND OF THE INVENTION

Color television receivers utilize a horizontal output transformer to effect coupling of horizontal sweep signals from a horizontal output stage to deflection apparatus associated with a cathode ray tube. Also, the horizontal output transformer effects development of high voltage potentials for application to the electron beam accelerating electrodes of a cathode ray tube. Moreover, the horizontal output transformer provides focus potentials for the cathode ray tube as well as flyback potentials, AGC keyer potentials, blanking potentials and numerous other ancillary potentials and functions.

Normally, horizontal output transformers of the prior art include a coil form of electrical insulating material whereon primary and auxiliary windings are located. A high voltage winding surrounds and is affixed by adhesive or in some similar manner to the primary and auxiliary windings. Also, the high voltage winding is surrounded by a corona tire of non-inflammable material either prior to or after attachment thereof to the primary and auxiliary windings.

Following, the coil form is telescoped over a pair of confronting leg members of a pair of substantially U-shaped core members and positionally held thereon by wedges, adhesive, or some similar technique. Also, leads exiting from the coil are electrically insulated in some manner and affixed to a circuit board attached to the U-shaped core members. A U-shaped wire member affixes the U-shaped core members to a support.

Although the above-mentioned horizontal output transformers have been and still are widely employed in television receivers, it has been found that there is something to be desired insofar as economy and efficiency is concerned. More specifically, it has been found that positionally locating the coil on the core member by wedges and similar techniques and adding insulators to wires for attachment thereof to a circuit board leaves much to be desired insofar as efficiency of construction and time is concerned. Moreover, exposed leads and circuit board connections are incompatible to enhanced non-inflammable construction.

OBJECTS AND SUMMARY OF THE INVENTION

An object of the present invention is to provide an enhanced horizontal output transformer for a television receiver. Another object of the invention is to provide improved electrical coupling for a horizontal output transformer. Still another object of the invention is to provide improved indexing and attachment of a coil form to a core member of a horizontal output transformer. A further object of the invention is to provide a horizontal output transformer of improved fire-proof characteristics. A still further object of the invention is to provide an improved process for fabricating horizontal output transformers.

These and other objects, advantages and capabilities are achieved in one aspect of the invention by a horizontal output transformer having a coil member formed on a hollow insulator telescoped over a pair of confronting leg members of a pair of U-shaped core members. An arcuate ring member is affixed to the coil member and has a plurality of contact pins connectable to a plurality of leads extending outwardly from the coil with an envelope of non-inflammable material surrounding the coil member, core member, and leads.

The horizontal output transformer is fabricated by a process which includes winding a wire coil member with indicating markers therein, affixing an arcuate ring member having contact pins therein to the coil member, selecting wires of the coil member indicated by the markers and affixing a wire to a contact pin of the ring member, wax impregnating the coil member, encapsulating the coil member, selected wires, and ring members, and assembling the coil member and a pair of U-shaped core members.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a portion of the horizontal output transformer wherein a ring member with contact pins therein is affixed to a coil member;

FIG. 2 illustrates, in exploded form, a preferred horizontal output transformer embodiment; and

FIG. 3 is a cross-sectional view of FIG. 2 taken along the lines 3—3.

DESCRIPTION OF A PREFERRED EMBODIMENT

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 in conjunction with the appended claims and accompanying drawings.

Referring to FIG. 1 of the drawings, a preferred form of horizontal output transformer includes a coil member **5** wound on a hollow insulator **6** and having a plurality of wire leads **7** extending outwardly therefrom. A substantially arcuate ring member **9** having a plurality of slotted contact pins **11** therein is affixed to the periphery of the coil member **5**. Moreover, each of the wire leads **7** is connected to at least one of the contact pins **11**.

As to fabrication of a horizontal output transformer, the coil member **5** is wound on the hollow insulator **6** with a plurality of wire indicating markers included within the winding. The wires located at each of the wire markers are selected to provide wire leads **7** extending outwardly from the coil member **5**.

A substantially arcuate ring member **9** is pressure fitted to the periphery of the coil member **5**. Also, the ring member **9** includes a plurality of contact pins **11**, which are preferably of the slotted variety to permit attaching the wire leads without wrapping. Each one of the wire leads **7** is affixed to at least one of the contact pins **11**. Obviously, the contact pins **11** may be of a variety other than slotted and the wire leads **7** may be attached thereto by soldering, welding, or any one of a number of well known attaching techniques.

The coil member **5** is impregnated with any one of a number of well known fire-resistant waxes, such as Wax No. G5945 for instance, available from the Biwax Co., Des Plaines, Illinois. The wax impregnated coil members **5**, wire leads **7**, and ring member **9** are surrounded with an envelope, **13** of FIG. **2**, of non-inflammable material. For example, one well known non-inflammable material is known as a vinyl epoxy thermosetting resin referred to as RL-095-16 and manufactured by the Michell-Rand Manufacturing Corporation of Hillburn, New York. Moreover, numerous non-inflammable materials in the form of vinyl epoxy resins are readily available and attainable on the commercial market.

Referring to the exploded view of FIG. **2**, the envelope **13** surrounding the coil member **5** includes an indenture **15** and an arc-resisting indented circle **16** formed therein. A pair of U-shaped core members **17** and **19** each have a pair of leg members, **21** and **23** and **25** and **27** respectively, which are spaced by a pair of interconnecting members **29** and **31**.

The coil member **5** with the envelope **13** thereon is telescoped over a pair of confronting leg members **23** and **27** of the U-shaped core members **17** and **19**. The indenture **15** is formed for cooperative engagement with an interconnecting member **31** of the U-shaped core member **19** and disposed intermediate the pair of interconnecting members **29** and **31**.

Thereafter, a substantially U-shaped wire member **33**, having a protuberance **35** therein, is fitted into grooves **37** and **39** extending along the leg members **21**, **23**, **25**, and **27** of the U-shaped core members **17** and **19**. The U-shaped wire member **33** extends through a support member **41** and is affixed by a pair of nuts **43** and **45**. Moreover, the protuberance **35** of the wire member **33** exerts a pressure intermediate the hollow insulator **6** of the core member **5** and the U-shaped core members **17** and **19**. Thus, the indenture **15** as well as the protuberance **35** tend to maintain the core member **5** in a fixed rotational position with respect to the core members **17** and **19**.

As can be seen in the cross-sectional view of FIG. 3, taken along the line 3-3 of FIG. 2, the coil member 5 with the affixed ring member 9 having the outwardly extending contact pins 11 and covered by an envelope 13 of non-inflammable material is telescoped over confronting leg members 23 and 27 of the U-shaped core members 17 and 19. The core members 17 and 19 are positionally held by the U-shaped wire member 33 and the coil member 5 is rotationally held by the pressure intermediate the indentation 15 of the envelope 13 and one of the core members 19 and by the pressure intermediate the protuberance 35 of the U-shaped wire member 33 and the core member 5.

Thus, there has been provided a unique horizontal output transformer suitable for use in television receivers. The transformer includes a coil member totally enclosed in an envelope of non-inflammable material as well as greatly enhanced lead connection capabilities. Moreover, the structure also features improved techniques for achieving and maintaining rotational stability of a coil member with respect to the core members of a transformer.

Further, the transformer is fabricated by an improved process having numerous advantages over other known techniques. The process is economical of both time and operator labor due to the improved cooperation between the indented envelope and core members. Moreover, the fabrication process is attainable at a speed and cost believed to be unattainable by other known techniques.

While there has been shown and described what is at present considered the preferred embodiment of the invention, it will be understood that various changes and modifications may be made therein without departing from the invention as defined by the appended claims.

We claim:

1. A horizontal output transformer for a television receiver comprising:

a pair of substantially U-shaped core members each having a pair of leg members positioned in confronting relationship with one another;

a coil member formed about a hollow insulator telescoped over a pair of adjacent leg members of said pair of core members, said coil member having a plurality of wire leads extending outwardly therefrom;

a substantially arcuate ring member affixed to said coil member and having a plurality of contact pins extending outwardly therefrom, each of said pins being connectable to at least one of said wire leads;

an envelope of non-inflammable material surrounding said coil member, said ring member, and said wire leads affixed to said contact pins; and

a substantially U-shaped wire member in peripheral engagement with at least one of said pair of core members and affixed to a support member, said wire member extending intermediate said pair of adjacent leg members in confronting relationship and said hollow insulator supporting said coil member and formed for pressure engagement therewith.

2. The combination of claim 1 wherein said contact pins are in the form of slotted terminals for automatic attachment and clipping of said wire leads.

3. The combination of claim 1 wherein said ring member is in the form of a self-retaining molded terminal ring pressure contacting said coil member.

4. The combination of claim 1 wherein said U-shaped wire member includes a protuberance formed for pressure engagement with said leg members and said hollow insulator supporting said coil member whereby said protuberance and said molded indentation cooperate to affix said coil member to said pair of core members.

* * * * *