United States Patent

[11] 3,611,221

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[33] **Japan**
[31] **44/77277**

[54] **CONVERGENCE YOKE APPARATUS FOR COLOR TELEVISION RECEIVER**
1 Claim, 2 Drawing Figs.

[52] **U.S. Cl.** **335/212**
[51] **Int. Cl.** **H01f 1/00**
[50] **Field of Search** 335/212; 313/76, 77

[56] **References Cited**
UNITED STATES PATENTS
3,534,208 10/1970 Kruckhaudt et al. 313/77

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ABSTRACT: In a convergence yoke apparatus for color television receivers comprising two magnetic cores, one of the cores cooperating with an electron gun B and the other with electron guns R and G contained in a color cathode-ray tube, the other core is formed to have a letter E configuration, horizontal and vertical coils are wound upon two outer legs of the E-shaped core and a compensation coil is wound on the central leg.

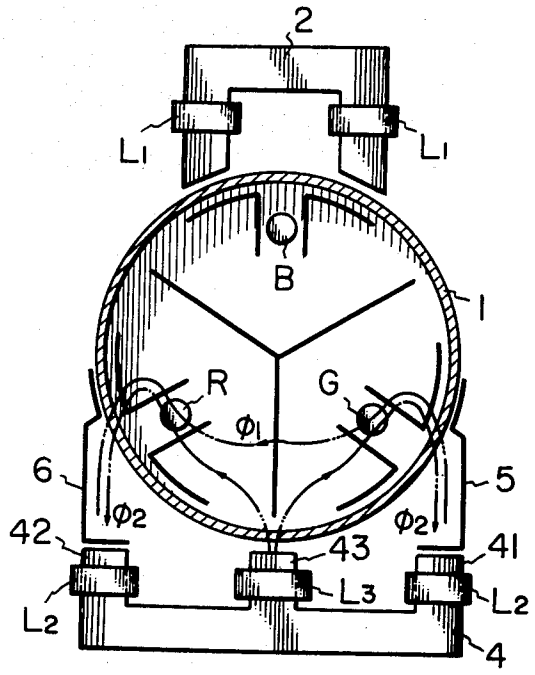


FIG. 1
PRIOR ART

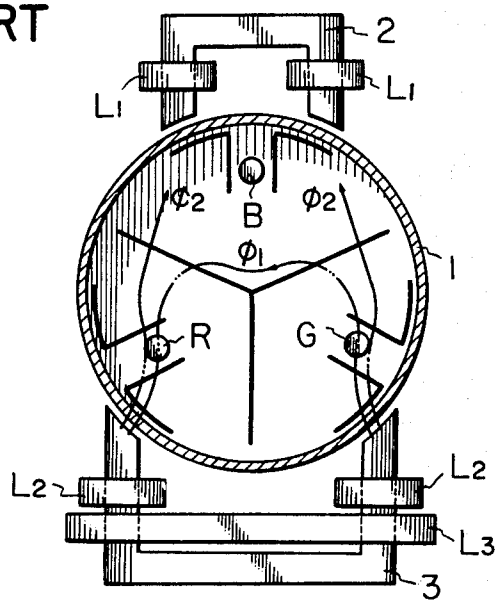
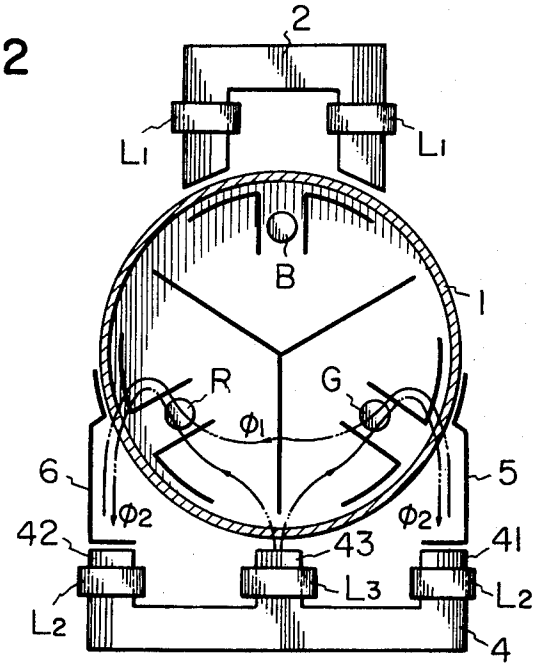


FIG. 2



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CONVERGENCE YOKE APPARATUS FOR COLOR TELEVISION RECEIVER

BACKGROUND OF THE INVENTION

This invention relates to a novel convergence yoke apparatus for use in color television receivers.

As diagrammatically shown in FIG. 1, in the prior art arrangement convergence cores 2 and 3 are disposed on the opposite sides of the neck 1 of a color cathode-ray tube containing three electron guns B, R and G emanating electron beams for blue, red and green, respectively. Convergence core 2 for blue electron gun B has horizontal and vertical coils L_1 (for brevity, two types of coils are shown as a single coils) and the outer ends of two legs of the core 2 are disposed to oppose pole pieces of electron gun B. On the other hand, convergence core 3 is utilized in common for red and green electron guns R and G and is also provided with horizontal and vertical coils L_2 on its two legs. With this type of the convergence apparatus when the cathode-ray tube and deflection coils are constructed perfectly the convergence operation is performed theoretically. However due to inaccuracies in the cathode-ray tube and deflection coils it is not always possible to obtain satisfactory results. In order to magnetically compensate for such inaccuracies a compensation coil L_3 wound about two legs of the core 3 has been used as is well known in the art. Assuming now that coils L_2 and L_3 are excited to produce fluxes Φ_1 and Φ_2 as shown in FIG. 1, in the field region of electron gun G fluxes Φ_1 and Φ_2 add each other whereas in the field region of electron gun R these fluxes subtract from each other. By adjusting the field intensity in this manner, it is possible to provide the desired compensation. As can be noted from FIG. 1, in the prior art apparatus, flux Φ_2 produced by compensation coil L_3 flows upwardly after passing through pole pieces of electron guns G and R. This means increased magnetic reluctance for flux Φ_2 thus decreasing the ability of the dynamic convergence.

SUMMARY OF THE INVENTION

It is an object of this invention to provide an improved convergence yoke for use in color television receivers capable of reducing the reluctance for the flux produced by the compensation coil thus improving the efficiency of the dynamic convergence.

According to this invention magnetic core 3 is modified to take the form of a letter E. The horizontal and vertical coils L_2 are wound on two outer legs of the core opposing pole pieces of electron guns R and G respectively and the compensation coil is wound on the center leg of the core. This arrangement greatly reduces the magnetic reluctance for the flux produced by the compensation coil thus increasing the efficiency of the dynamic convergence.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawing:

FIG. 1 is a diagrammatic representation, partly in section, of the prior art convergence yoke apparatus and

FIG. 2 is a similar view of the convergence yoke apparatus embodying this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to FIG. 2, like the arrangement shown in FIG. 1, a C-shaped core 2 has two legs opposing the pole pieces of an electron gun B and horizontal and vertical coils L_1 wound upon two legs and functions to converge the beam emanated from gun B. According to this invention the convergence function for electron beams emanated from electron guns R and G is provided by a single letter E shaped core 4 having three legs. Two outer legs 41 and 42 of the core carry horizontal and vertical coils L_2 to produce convergence flux Φ_1 while central leg 43 carries t compensation coil L_3 for producing flux Φ_2. In the field region of the electron gun R fluxes Φ_1 and Φ_2 add each other while in the field region of electron gun G, these fluxes subtract from each other, thus providing the desired compensation effect. It is to be particularly noted that since flux Φ_2 flows through two paths, each starting from the central leg 43 and returning to respective outer legs 41 and 42 respectively through pole pieces of electron guns G and R it is possible to greatly reduce the reluctance to flux Φ_2 when compared with the prior arrangement shown in FIG. 1. As diagrammatically shown in FIG. 2, magnetic members 5 and 6 are provided to decrease the magnetic reluctance between two outer legs of the core 4 and the pole pieces of electron guns R and G. However these magnetic members may be omitted if outer legs 41 and 42 are extended close to the wall of the neck 1 of the cathode-ray tube.

Thus, according to this invention the convergence core for electron guns R and G is formed to have a letter E configuration and a compensation coil is wound on the central leg of the core thus greatly reducing the reluctance to the flux generated by the compensation coil and thus increasing the dynamic convergence effect.

While the invention has been shown and described in terms of the preferred embodiment thereof various changes and modifications will occur to one skilled in the art without departing from the true spirit and scope of the invention as defined in the appended claim.

What is claimed is:

1. In convergence yoke apparatus for use in a color television cathode-ray tube of the type including two magnetic cores cooperating with electron guns contained in said cathode-ray tube the improvement which comprises a letter C shaped magnetic core with two legs opposed to the pole piece of an electron gun for emanating an electron beam for blue, said legs carrying horizontal and vertical coils, a letter E shaped magnetic core, two outer legs of said E-shaped core carrying horizontal and vertical coils and opposing pole pieces of electron guns emanating electron beams for red and green, and a compensation coil wound upon the central leg of said E-shaped core.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,611,221 Dated October 5, 1971

Inventor(s) Hiroshi Ikeuchi

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 14, change "coils" to -- coil --;

Column 1, line 29, before "each" insert -- to --;

Column 2, line 16, delete "t" and insert -- a --.

Signed and sealed this 25th day of April 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents