Aug. 7, 1951 A. P. HULTGREN 2,563,116

SHELL FOR DEFLECTION YOKES

Filed June 10, 1950

Fig. 1

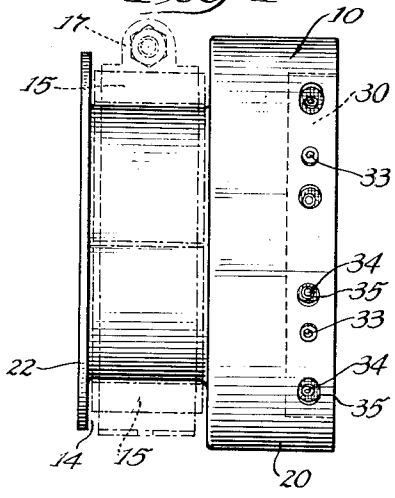


Fig. 2

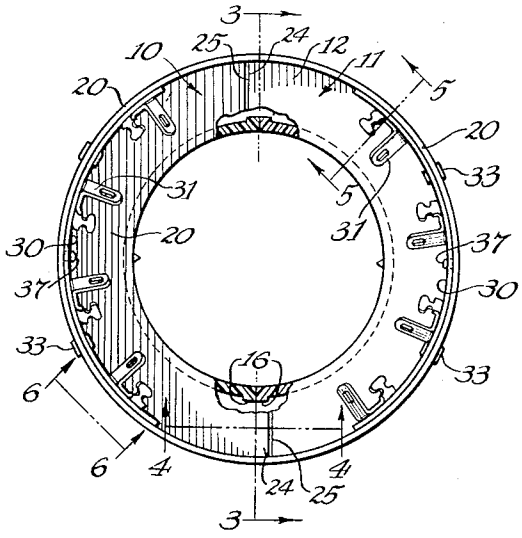


Fig. 3

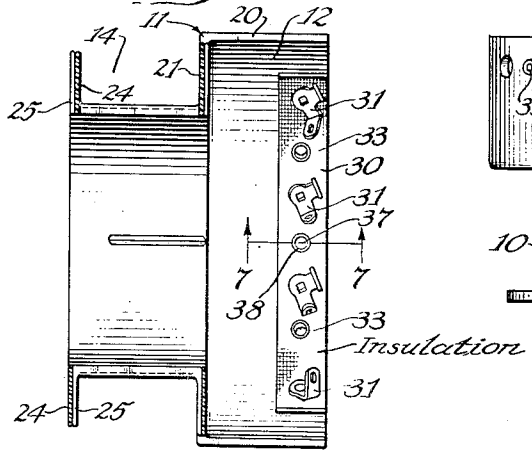


Fig. 4

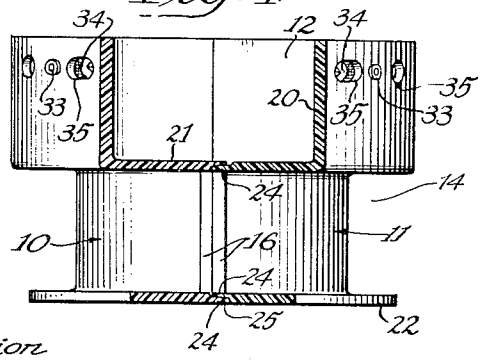


Fig. 5

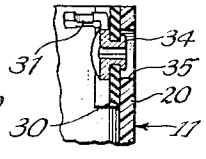


Fig. 7

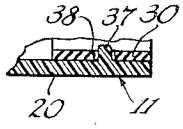
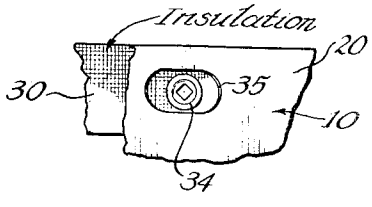


Fig. 6



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SHELL FOR DEFLECTION YOKES

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7 Claims. (Cl. 313—75)

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This invention relates to a shell for a deflection yoke of the type adapted for use in television receiving apparatus. More particularly, the present invention is directed to a deflection yoke shell of the type which is formed at one end so as to provide an open-ended annular chamber, and the opposite end being formed to provide an external annular groove in which may be fixedly mounted a plurality of arcuate permanent, magnet segments. The shell is composed of two substantially identical members of generally semi-circular contour, adapted to be firmly secured together as a unit.

I am aware of the fact that at the present time, deflection yoke shells of the above mentioned type which are commercially available, are formed of thermosetting plastic material, such as for example, phenolic condensation products. Such shells are not entirely satisfactory because of the numerous attendant disadvantages, such as high cost, being relatively brittle and subject to rupture or cracking when connected together with permanent magnet segments strapped in place thereon, or sometimes when the shells are accidentally dropped. Sometimes such shells become defective after they have been assembled with the magnets thereon and the coil therein in process of mounting on the neck of a cathode ray tube.

One of the objects of the present invention is to provide a novel and improved deflection yoke shell of the general character above indicated which is relatively economical to manufacture, and which is durable in use, and which is not apt to easily rupture or fracture in handling or assembly or in mounting in operative position.

Another object is to provide a novel and improved shell of the character indicated which is capable of a substantial amount of distortion without rupture incident to assembly with other elements or in mounting in operative position.

A further object is to provide an improved shell of the character indicated comprising two identical, generally semi-cylindrical members formed of thermoplastic material, an assembly composed of a strip of insulating material possessing heat and electrical insulating characteristics on which is fixedly secured a plurality of electrical terminal clips, and the assembly being rigidly attached to the inner wall of the annular chamber of the shell.

Other objects and advantages of this invention will be apparent from the following description, taken in connection with the accompanying drawing in which:

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Figure 1 is a side sectional view of the shell embodying the present invention;

Figure 2 is an end elevational view of the shell with portions broken away to show details of construction;

Figure 3 is a vertical section through an assembled shell, taken substantially as indicated at line 3—3 on Figure 2;

Figure 4 is a view of the shell, part in section and part in side elevation, taken substantially as indicated at line 4—4 on Figure 2;

Figure 5 is an enlarged sectional view of the shell as indicated at line 5—5 on Figure 2;

Figure 6 is a fragmentary, enlarged side elevational view of a portion of the exterior of the shell, taken as indicated at line 6—6 on Figure 2; and

Figure 7 is an enlarged sectional view taken at line 7—7 on Figure 3.

The shell embodying the present invention is composed of two identical, generally semi-tubular members indicated at 10 and 11, adapted to be disposed in juxtaposed relation to form a generally tubular structure, and when so assembled, form at one end thereof, an open-ended annular chamber 12 and the opposite end being formed to provide an external annular groove 14. Shells of the type embodying the present invention are adapted to have mounted in the groove a plurality of permanent magnets in the form of arcuate segments, as indicated in dot and dash outline at 15 in Figure 1. The permanent magnet segments are formed, on their inner wall, with a transverse groove constituting keyways for seating upon ribs or keys, as indicated at 16, formed at the free edges of the respective shell members at the area constituting the groove 14 so that the permanent magnet segments tend to lock themselves in position with respect to the shell, and the seating of the magnets on the ribs 16 tend to lock the shell members 10 and 11, together in proper assembled relation. The segments of permanent magnets are firmly held in clamped position in the groove in any conventional manner such as a metallic strip, as indicated in dot and dash outline at 17.

The respective shell members each include a semi-annular wall 20, which, together, define the annular chamber 12, and the inner end of said wall is connected to a semi-annular, radially extending wall 21, which constitutes a flange for the annular groove 14. The extreme opposite ends of the members are formed with a semi-annular flange 22 which constitute the outer flange for the annular groove 14. The abutting edges of the semi-circular walls 21 and semi-an-

nular flanges 22 are provided with interengaging tongue and groove features 24 and 25 for insuring proper alignment and relative positioning of the two members 10 and 11 in assembled relation.

The two shell members 10 and 11 are formed of thermoplastic material such as for example, cellulose acetate, which permits substantial reduction in cost and eliminates the undesirable characteristic of extreme brittleness in presently available shell structures of the general type above referred to. Thermoplastic materials are relatively pliable and flexible and permit a substantial amount of distortion without rupture, and therefore, reduce or substantially eliminate all possibility of breakage incident to clamping of permanent magnet segments in position in the annular groove of the assembled shell. Furthermore, because the permanent magnet segments currently employed are produced of powdered metal, if an appreciable amount of distortion of the shell is not provided for, it frequently happens that the permanent magnet segments become cracked and must be discarded and replaced.

In using thermoplastic material to produce the shell, mounting of electrical terminal clips on the shell presents an important problem because the usual practice is to solder conductor wires to the terminal clips, and hence the heat resulting from the soldering operation desirably should not be transmitted to the shell formed of thermoplastic material, as it would result in distortion and deformation of the shell members. Considerable damage thereto might result, to the extent necessitating discarding of the shell. Therefore, it is desirable that electrical terminal clips be mounted with respect to the shell in heat and also electrical insulated relation thereto. For this purpose, I provide an assembly comprising a strip 30 of suitable insulating material having both heat and electrical insulating characteristics, on which is riveted, in spaced apart relation, a plurality of electrical terminal clips 31. Such an assembly is then rigidly and firmly attached to the inner surface of the wall 20 of each shell member, so that the terminal clips are disposed within the annular chamber 12 of the assembled shell in a conventional relation. Said assembly may be secured to the shell in any desirable manner, such as by turning over two molded lugs, or by means of a snap arrangement, or as indicated by rivets 33. As may be seen in the drawing, each of the terminals 31 is rigidly attached to the strip 30 by means of a rivet 34, the outer end of which would normally contact the inner surface of the wall 20 of the shell member. To avoid transmission of heat to the shell member during the soldering operation in connecting a conductor wire to a clip by transmission through the rivet 34, I preferably form the wall 20 with a series of openings 35 in registration with each of the rivets 34 associated with the clips 31, and which openings are of a size as to insure spaced relationship of the marginal edges of the openings with respect to the head of the rivet, as may be seen in Figures 5 and 6 of the drawings.

Although the terminal clips could be directly secured to the wall 20 of the shell members in heat and electrical insulated relation thereto by the use of insulated bushings of the desirable characteristics, through which a rivet extends, I prefer, however, to employ the constructional arrangement herein disclosed for both economy in manufacture and simplicity of assembly, by

virtue of which the terminal clips 31 are first riveted to the insulating strip 30 and the assembly then secured to the shell member.

To insure proper positioning of the strip 30 carrying the clips with respect to the inner surface of the wall 20 of the shell member, said shell member is formed with an inwardly projecting nubbin 37 with which registers an aperture 38 formed in the strip 30, as clearly seen in Figures 3 and 7 of the drawing.

Although I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise form herein disclosed, except as I may be so limited by the appended claims.

I claim as my invention:

1. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form an open-ended annular chamber at one end and the exterior of the opposite end being formed to constitute a flanged annular groove for the reception of a plurality of permanent magnets therein; said members being formed of thermoplastic material, a strip of material of heat and electrical insulating characteristics fitted against the inner surface of the outer wall, of one of said members, defining a portion of said annular chamber, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, and means for rigidly securing said assembly of strip and terminal clips to said wall of said one member.

2. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form an open-ended annular chamber at one end and the exterior of the opposite end being formed to constitute a flanged annular groove for the reception of a plurality of permament magnets therein; said members being formed of thermoplastic material, a strip of material of heat and electrical insulating characteristics fitted against the inner surface of the outer wall, of one of said members, defining a portion of said annular chamber, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, and means for rigidly securing said assembly of strip and terminal clips to said wall of said one member, said wall being formed with a plurality of apertures of a size greater than the heads of and registering with said rivets.

3. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form an open-ended annular chamber at one end and the exterior of the opposite end being formed to constitute a flanged annular groove for the reception of a plurality of permanent magnets therein; said members being formed of thermoplastic material, a strip of material of heat and electrical insulating characteristics fitted against the inner surface of the outer wall, of one of said members, defining a portion of said annular chamber, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, said wall having an internally projecting nubbin adapted for seating in an aperture formed in said strip for insuring proper positioning of the strip in a desired circumferential relation to the wall, and

means for rigidly securing said assembly of strip and terminal clips to said wall of said one member.

4. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form an open-ended annular chamber at one end and the exterior of the opposite end being formed to constitute a flanged annular groove for the reception of a plurality of permanent magnets therein; said members being formed of thermoplastic material, a strip of material of heat and electrical insulating characteristics fitted against the inner surface of the outer wall, of one of said members, defining a portion of said annular chamber, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, said wall having an internally projecting nubbin adapted for seating in an aperture formed in said strip for insuring proper positioning of the strip in a desired circumferential relation to the wall, and means for rigidly securing said assembly of strip and terminal clips to said wall of said one member, said wall being formed with a plurality of apertures of a size greater than the heads of and registering with said rivets.

5. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form an open-ended annular chamber at one end and the exterior of the opposite end being formed to constitute a flanged annular groove for the reception of a plurality of permanent magnets therein; said members being formed of thermoplastic material, a plurality of electrical terminal clips, and means for securing said clips to the outer wall portions of said members, which form said chamber, in circumferentially spaced apart relation, and in heat and electrical insulated relation to said wall portions.

6. A deflection yoke shell comprising a pair of identical members of generally semi-cylindrical form, adapted to be assembled in cooperative relation to form a flanged annular groove, said members being formed of thermoplastic material, a strip of material of heat and electrical insulating characteristics fitted against the wall of one of said members, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, and means for rigidly securing said assembly of strip and terminal clips to said wall of said one member, said wall being formed with a plurality of apertures of a size greater than the heads of and registering with said rivets.

7. A pair of identical generally semi-cylindrical members adapted to be assembled in cooperative relation to form a flanged annular groove, said members being formed of thermoplastic material, a strip of material of heat and electrical insulated characteristics fitted against a surface of one of said members external of said annular groove, a plurality of electrical terminal clips, rivets securing said clips to said strip in spaced apart relation, and means for rigidly securing said assembly of strip and terminal clips to said surface of said one member.

ARNOLD P. HULTGREN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,207,777	Blain	July 16, 1940
2,228,821	Hansen	Jan. 14, 1941
2,443,025	De Tar	June 8, 1948
2,501,516	Holden	Mar. 21, 1950