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ELECTROMAGNETIC TRANSDUCER HEAD HOUSING AND ASSEMBLY

Original Filed Aug. 19, 1958

Fig 1

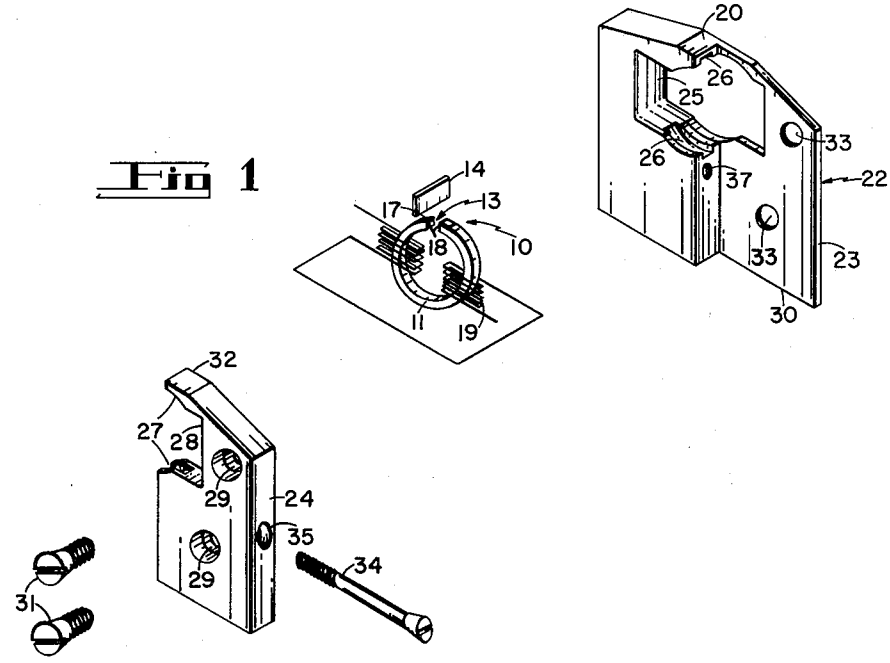
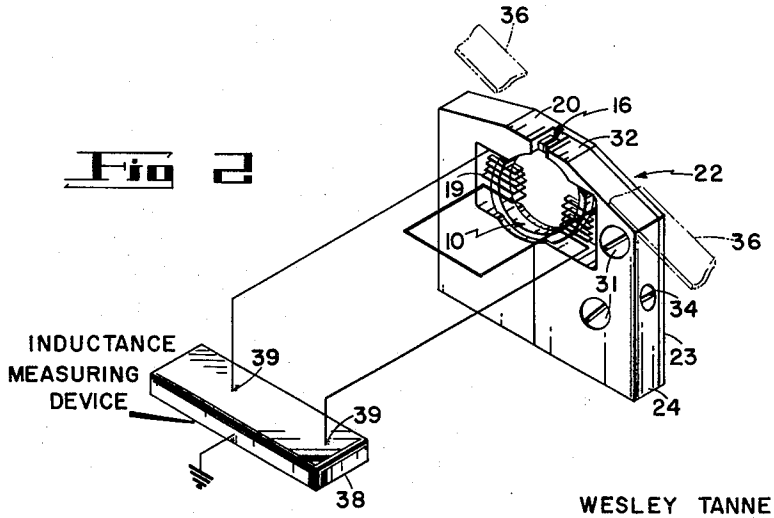


Fig 2



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ELECTROMAGNETIC TRANSDUCER HEAD HOUSING AND ASSEMBLY

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1 Claim. (Cl. 179—100.2)

This invention relates to electromagnetic transducer heads, and more particularly to a housing therefor, and to an assembly comprising a transducer head and the housing.

The subject matter described herein was first disclosed and described in a co-pending application, Serial Number 756,028, filed August 19, 1958, of which the present application is a division. The parent application discloses and claims a method of making a transducer gap for electromagnetic transducer heads.

It is an object of the invention to provide an electromagnetic transducer head assembly comprising a transducer head and a housing, which housing includes means for adjusting the gap length of the transducer head during the assembly of its component parts.

It is another object of the invention to provide an electromagnetic transducer head assembly which includes means for maintaining a transducer head in a fixed relationship within the assembly and also includes means for maintaining its gap length fixed.

It is another object of the invention to provide a housing for electromagnetic transducer heads which includes means for adjusting the transducer gap length and maintaining the adjusted length fixed.

It is yet another object of the invention to provide an electromagnetic transducer head assembly having a pair of arcuate channels containing an electromagnetic transducer head, one of the channels being movable with respect to the other for adjusting the transducer gap length. Provision is also made for clamping the movable channel for maintaining the transducer gap length in the adjusted position.

In accordance with the invention, an electromagnetic transducer head assembly comprises an electromagnetic transducer head which includes a non-magnetic gap defined by a wafer of non-magnetic material situated between a pair of pole faces. The assembly includes a housing for containing the transducer head. The housing includes means for first moving the pole faces toward each other to adjust their spacing and then maintaining the adjusted spacing.

The novel features that are considered characteristic of the invention are set forth in the appended claims; the invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in conjunction with the accompanying drawings, in which:

FIG. 1 is an exploded view of an electromagnetic transducer head assembly including a transducer head and its housing; and

FIG. 2 is a perspective view showing an assembled transducer head assembly.

For a better understanding of the basic principles of the invention reference is made to the drawings, FIGS. 1 and 2, wherein an assembly comprising an electromagnetic transducer 10 and a housing 22 are shown. The electromagnetic transducer head 10 comprises a toroidal magnetic core 11, a winding 12 wound around the core and an air gap 13.

In this application the discontinuity in the core, designated 13, will be referred to as an air gap. A partially formed or a fully formed discontinuity which includes a non-magnetic material in the air gap will be referred to as a transducer gap.

The air gap 13 is defined by a pair of pole faces 18 formed in any of the conventional configurations. A pair of planar surfaces 17 lie adjacent to the air gap on the surface of the core 11. It is not intended to limit this invention to accommodating a toroidal or a ring type transducer head, and this shape is presented for illustrative purposes only. The transducer head 10 may be formed in any suitable manner. To convert the air gap 13 to a transducer gap, a wafer 14, of non-magnetic material, preferably a malleable material, gold for example, is inserted between the pole faces 18. The pole faces are then brought toward each other, compressing the wafer, until a predetermined spacing is obtained, thus forming a transducer gap having a predetermined length. The wafer 14 is shown above the air gap 13 in FIG. 1.

The preferred method of applying pressure for adjusting the gap to a predetermined length is to insert the gold wafer 14 inside the air gap 13 and placing the transducer 10 inside the housing 22. The housing 22 includes a base 23 and a clamp 24, formed from a non-magnetic material, aluminum for example.

The base 23 includes a pair of arcuate channel sections 26 for seating the toroidal core 11. Defined between the channel sections 26 is a rectangular recess 25 which is provided as clearance for one section of winding 19. The clamp 24 includes a pair of arcuate channel sections 27 and a recess 28 identical in all respects to those included in the base 23. The clamp 24 sits in a depression 30 on base 23 so that the respective channels 26 and 27 are aligned opposite each other. The clamp 24 is adapted to be secured to the base 23 by means of a pair of screws 31 passing through clearance holes 29 in clamp 24 and screwed into a pair of tapped holes 33 provided on the base 23. For adjusting the gap length, an adjusting screw 34, adapted to fit into a clearance hole 35 in the edge of clamp 24 and into a tapped hole 37 in base 23 is provided.

The upper edge of base 23 and clamp 24 includes horizontal guide surfaces 20 and 32 respectively. When the core 10 is positioned in the housing 22 the planar surfaces 17 and the guide surfaces 20 and 32 lie in the same plane (FIG. 2). The guide surfaces are provided to assure a proper disposition of the magnetized medium, in this instance magnetic tape 36, and the transducer gap, designated 16.

The electromagnetic transducer head assembly showing the transducer head 10 contained within the housing 22 is shown in FIG. 2. Also shown is an inductance measuring device 38 such as a General Radio Company Bridge Model 650A, or its equivalent. A pair of terminals 39 on the inductance measuring device 38 are coupled to the winding 19 on the core 11.

The length of the transducer gap 16 is normally adjusted after the transducer head 10, with a gold wafer 14 included in the air gap 13, is positioned in the housing 22. When the clamp 24 is initially seated in the depression 30 only the lower screw 31 is inserted. This permits the clamp 24 to pivot about the lower screw 31. To adjust the length of the gap 16 the adjusting screw 34 is inserted in hole 35 and threaded into hole 37. See FIG. 1. As the adjusting screw 34 is threaded into base 23, its head bears against the clamp 24 and rotates it counterclockwise around the lower screw 31. During the counterclockwise rotation an increasing pressure is applied to the core 11 tending to bring the opposing pole faces 18 together, thus reducing the thickness of the gold wafer

14. Also as the screw 34 is tightened, the inductance of the winding 19 is measured on the inductance measuring device 38 and the actuation of the screw 34 is terminated when the desired inductance is obtained. To prevent further relative movement between the opposing pole faces 18, the upper screw 31 is inserted in the holes provided for it and tightened securing the clamp 24 to the base 23 in a fixed relative position. The gold not enclosed by the pole faces 18 is then removed.

An alternative procedure for adjusting the length of the transducer gap 16 is to place the entire head assembly, prior to adjusting the gap length under a calibrated microscope. The adjusting screw 34 is then actuated and operated until a desired gap length is observed under the microscope. This latter procedure is preferable where the designer is interested in obtaining a transducer gap having a predetermined length without regard to the electrical characteristics arising from its formation. It is obvious that the former procedure, of using the inductance measuring device 38, will be preferred where specific electrical characteristics are to be produced.

The various features and advantages of the invention are thought to be clear from the foregoing description. Various other features and advantages not specifically enumerated will undoubtedly occur to those versed in the art, as likewise will many variations and modifications of the preferred embodiment illustrated, all of which may be achieved without departing from the spirit and scope of the invention as defined by the following claim.

We claim:

A housing for an electromagnetic transducer head including a pair of pole faces defining a nonmagnetic gap comprising:

(*a*) a base member including a recess, a channel dimensioned to receive a portion of said head defined therein and a threaded hole;

(*b*) a clamp seated in said recess which includes a complementary channel defined therein to receive another portion of said head, a clearance hole dimensioned to be substantially coaxial with said threaded hole; and

(*c*) means comprising a screw passing through said clearance hole into said threaded hole, said screw including a surface bearing against said clamp for rotating said clamp tending to abut said pole faces when said screw is threaded into said base member.

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