Sept. 30, 1958 E. A. QUADE 2,854,525

MAGNETIC TRANSDUCER

Filed July 19, 1954

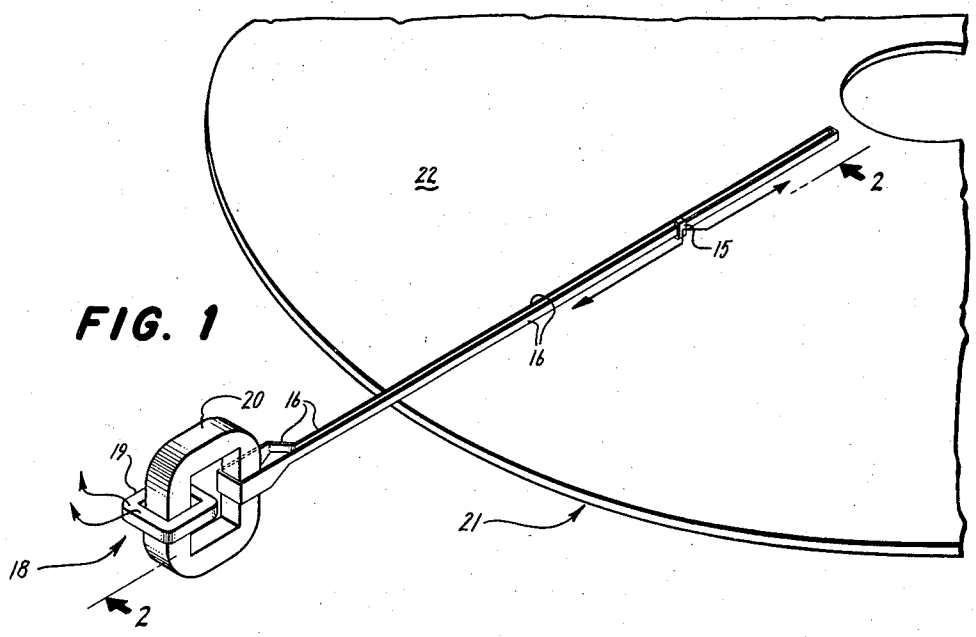


FIG. 1

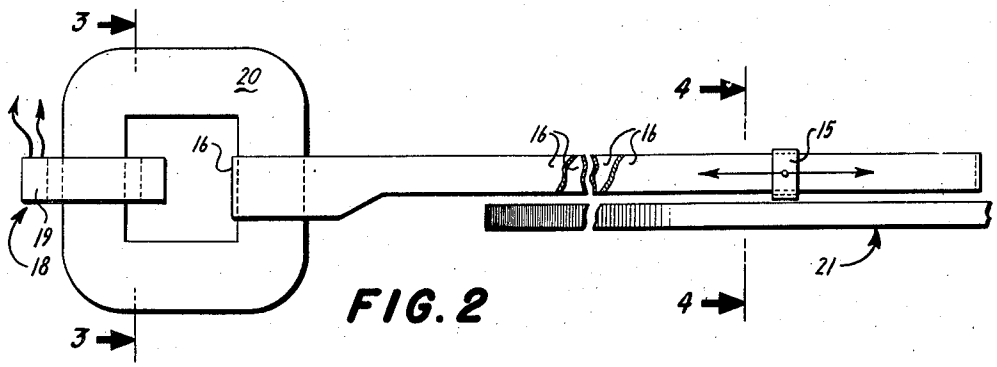


FIG. 2

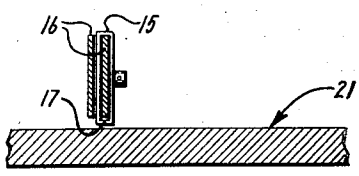


FIG. 4

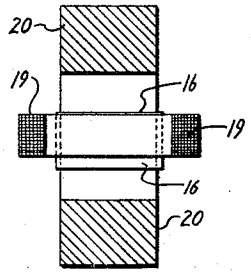


FIG. 3

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MAGNETIC TRANSDUCER

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5 Claims. (Cl. 179—100.2)

The present invention relates generally to magnetic transducers.

In the computer field, as well as in other allied fields, there is an ever increasing demand for movable recording heads which permit recording on or read-out from various portions of a record medium. Accordingly, it is one object of this invention to provide an improved, movable recording head.

To permit fast access times, i. e., to permit the recording head to be rapidly repositioned, it is desirable that the mass to be moved be as small as possible. It is, therefore, another object of this invention to provide a movable recording head having a very low mass.

Still another object of the invention is to provide a magnetic transducer which is simple and which is relatively inexpensive to fabricate.

A further object is to provide a novel transducer wherein the core thereof is movable relative to its winding.

Another object of this invention is to provide a transducer of small size to give access between closely spaced magnetic records such as rotating discs.

A still further object is to provide a low mass recording head adapted to readily follow an irregular recording surface.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode which has been contemplated of applying that principle.

In the drawings:

Fig. 1 is a perspective view of the novel transducer disposed adjacent a recording medium.

Fig. 2 is an elevation taken along line 2—2 of Fig. 1.

Fig. 3 is a vertical section taken along line 3—3 of Fig. 2.

Fig. 4 is a vertical section taken along line 4—4 of Fig. 2.

The transducer of the invention comprises a magnetic core **15** (Fig. 2) of Mumetal or other suitable high permeability material slidably mounted on a winding **16**. In the present embodiment, the core **15** consists of a small strip of Mumetal which is loosely wrapped around the winding **16**, the adjacent ends of the strip being spaced apart a short distance to provide a non-magnetic gap **17** (Fig. 4) in the flux path around the core. It should be noted that the core may be constructed as above described or that it may be laminated, the particular construction to be used being dependent upon the existing operating conditions.

The winding **16** (Fig. 2) is but a single, endless turn of low resistance material, such as copper, of sufficient cross-sectional area to conduct the current necessary to obtain satisfactory recording. Under the conditions set up experimentally, it was found that a current in the neighborhood of ten amperes was necessary for a satisfactory recording, a rectangular conductor .020 inch by .125 inch being utilized for this purpose. It should be mentioned in this connection that the optimum high frequency response of the transducer may be achieved by maintaining the induction of the winding **16** at a minimum. This is accomplished by spacing the oppositely disposed portions of the winding **16** as close to each other as is practicable, while maintaining sufficient clearance therebetween to permit unobstructed movement of the core **15** along the winding **16**.

Current is induced in the single turn winding **16** by a transformer **18** which includes a multiturn winding **19** and a core **20**, the winding **16** being linked to the core **20**. It will be understood that the number of turns of the winding **19** is determined by the current available in the control structure with which it is to be associated. For example, if a control current in the neighborhood of .200 ampere is available, it is necessary that the winding **19** have approximately 50 turns to provide a current in the winding **16** of ten amperes.

In the use, the transducer is suitably supported to dispose the gap **17** of the core **15** closely adjacent the magnetic recording surface with which it is to be used. Referring to Figs. 1 and 2, it will be seen that the transducer is supported, by means not shown, in longitudinal alignment with the radius of a rotatable disc **21**, the surface **22** of which is coated with a suitable magnetizable material, and when the coil **19** is energized, a spot on the disc **21** adjacent the gap **17** is magnetized. Conversely, when the disc **21** is rotated and when a magnetized spot on the disc **21** is moved past the core **15**, a current is induced in the winding **19** which is utilized to effect read-out.

It was mentioned earlier herein that the core **15** is slidably mounted on the winding **16**, and it will be understood that the core may be adjustably positioned, in any convenient manner, along the radius of the disc **21** to permit information to be recorded on or taken from various, selected portions of the disc. Due to the very low mass of the core **15**, it is clear that it may be repositioned very quickly, thus maintaining the access time at a minimum. Additionally, in some applications, such as where discs having runout are utilized as the record medium, it may be desired that the core **15** be arranged to follow the surface of the disc to permit a more uniform recording. As noted above, the core **15** is loosely wrapped on the winding **16**, and is, therefore, readily adapted to follow the disc, the low mass of the core being extremely beneficial in this connection.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A transducer for coacting with a magnetic record member comprising an elongated winding extending parallel to the recording surface of said member and a core having mounting means for sliding said core along said winding to record or reproduce signals at different locations on said record member.

2. A transducer for coacting with a magnetic record member comprising an elongated, single-turn winding extending parallel with the recording surface of said member and a core slidably mounted upon said winding for movement there along to record or reproduce signals at different locations on said record member.

3. A transducer for coacting with a magnetic record member comprising an elongated winding extending parallel to and spaced from the recording surface of said member and a core having mounting means for sliding said

core along said winding to record or reproduce signals at different locations on said record member.

4. A transducer for coacting with a magnetic record member comprising an elongated, single-turn winding extending parallel with the recording surface of said member and a core embracing said winding and slidable there along to record or reproduce signals at different locations on said record member.

5. A transducer for coacting with a magnetic record member comprising an elongated winding extending parallel to the recording surface of said member and a core surrounding said winding having mounting means for sliding said core along said winding to record or reproduce signals at different locations on said record member.

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