

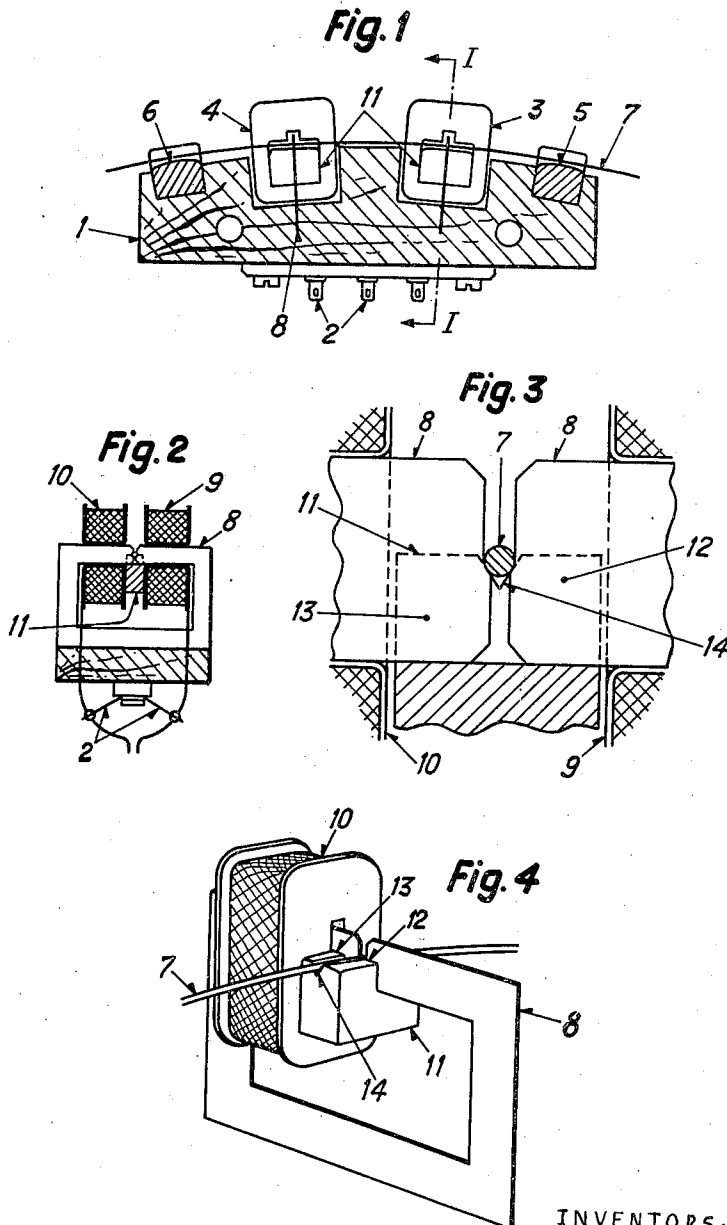
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MAGNETIC TRANSDUCER WITH WEAR-RESISTANT GUIDE SURFACES

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MAGNETIC TRANSDUCER WITH WEAR-RESISTANT GUIDE SURFACES

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1

Processes for magnetically registering sounds on suitable sound carriers, generally steel wires or ribbons, are already known. Special magnetic heads are used for recording, reproducing and erasing. These consist in a core magnetised by coils in such a way that, according to the arrangement adopted, the sound carrier receives either longitudinal or transversal magnetisation. Such magnetisation can be varied so that, for example, recording is effected by transversal magnetisation and erasure by intense longitudinal magnetisation.

Single units combining the three types of magnetic heads have already been constructed for recording, reproducing and erasing. As the design of the three types of magnetic heads is identical, the following description will simply refer to magnetic heads in general.

It is an accepted fact that regularity of recording is only possible as long as the distance between the core and the sound carrier to be magnetised remains constant. For this reason various attempts have been made to ensure a close contact between core and sound carrier. It has even been suggested to design the core in such a way that the sound carrier cuts into it, thus ensuring continuous and perfect contact between the two members.

This measure has, however, failed to give absolute regularity because, as experience has proved, the core is not equally susceptible to magnetisation throughout. It may therefore happen that, as it is abraded, a less magnetisable spot may suddenly come in contact with the sound carrier, and the regularity of the recording is thus disturbed. Moreover, it is obvious that, by continually abrading the core, the sound carrier itself wears out, and breakage is inevitable. The cores have to be replaced after a very short time, and this, apart from the work of replacement, is a drawback from the economical point of view.

The present invention relates to a recording, reproducing and erasing magnetic head in which the sound carrier is maintained at an invariable distance from the core, while breakage by abrasion of core and/or sound carrier is avoided. The magnetic head forming the object of the invention is characterised in that both core and sound carrier are guided in a member made of hard, non-metallic material. It also may be judged convenient to lodge the core in lateral slits in the hard, non-metallic member and to extend it as far as the longitudinal groove in which the sound carrier is guided.

2

When several members are arranged in the same casing, it has been found practical to guide the sound carrier in a convex flat curve, so that the tension of the wire automatically presses it against the magnetising members. This measure also ensures that the wire during recording and/or reproduction rotates but slightly round its longitudinal axis. In this way the current of reproduction is maintained constant, whereas it is a well-known fact that it can vary when the wire is allowed to rotate in respect of the position of recording.

The accompanying drawing illustrates, by way of example, one specific embodiment of the object of the invention, and in particular:

Fig. 1 shows the arrangement in a single unit of a recording, reproducing and erasing magnetic head and guiding members;

Fig. 2 is the cross-section of a magnetic head;

Fig. 3 shows the sound-carrier guide on an enlarged scale;

Fig. 4 is a view of the magnetic head in perspective.

In Fig. 1, on a base 1 made, for example, of wood are fitted connection terminals 2 for the recording and reproducing magnetic head. A magnetic head 3 and an erasing magnetic head 4 are also lodged in the base, to which are furthermore fitted guiding members 5 and 6. Thanks to the convenient convex shape of base 1 sound or record carrier 7 is guided in a convex curve over guides 5 and 6 and recording and reproducing magnetic heads 3 and 4. It has already been mentioned that, owing to this convex guidance, the tension of the wire automatically presses the sound carrier against the magnetising members, while reducing the rotation of the wire round its longitudinal axis. Such rotation cannot be completely avoided when a wire is utilised as sound carrier and has an unfavourable influence on the constancy of the current of reproduction.

Fig. 2 shows a cross-section of magnetic head 3. This consists in a recording core 8 on which are fitted two magnetising spools 9 and 10 and a part 11 made of a hard, non-metallic substance such as artificial precious or semi-precious stone, which serves as a guide for core 8 and sound carrier 7. Core 8 is lodged in transversal slits 12 and 13 so as to protrude as far as sound carrier guide-groove 14 whose profile may conveniently be given the shape of a convex curve.

In order to ensure close contact between core and sound carrier, it is well to fit the former so that it protrudes slightly over the guide-groove. Before being put into service it can be abraded

3

with the help of a wire (used solely for this purpose) of the same diameter as the sound carrier. After the core has been abraded to the guide-groove in the hard non-metallic part, a close contact between core and sound carrier is ensured and will not subsequently vary, as the tone carrier cannot cut into the hard substance.

The magnetic head forming the object of the present invention, though of simple design, affords an absolute guarantee of regular recording and reproduction. It requires no attention; the main drawback of the usual types of magnetic heads is thus eliminated. Needless to say, the utilisation of the magnetic head above described is not limited to wire sound carriers. It would be just as easy to employ steel tape or any other shape of carrier.

We claim:

1. In magnetic recording and reproducing heads, in combination with a sound carrier consisting of a round steel wire; a guide member consisting of a hard, precious or semi-precious stone and having a curved V-shaped groove formed therein which extends in one plane and the two surfaces of which are symmetrical in relation to said plane and support said wire, said guide member also having formed therein two opposed slits extending on opposite sides of said plane to said groove; a pair of flat pole pieces of magnetizable material immovably fitting in said slits, each of said pole pieces having a wire engaging surface curved complementary to said round steel wire and said wire-engaging surface being tangent to one of said surfaces of the V-shaped groove.

2. In magnetic recording and reproducing heads, in combination with a sound carrier consisting of a round, steel wire; a base, two guides carried by said base, at least one magnetic head carried by said base between said guides and com-

4

prising a guide member consisting of a hard, precious or semi-precious stone and having a curved, V-shaped groove formed therein which extends in one plane and the two surfaces of which are symmetrical in relation to said plane and support said wire, said two guides having curved grooves formed therein and extending in the same plane as said V-shaped groove of the guide member, the three grooves being concave and constituting a curved path for said sound carrier, said guide member also having formed therein two opposed slits extending on opposite sides of said plane to said groove, a pair of flat pole pieces of magnetizable material immovably fitting in said slits, each of said pole pieces having wire-engaging surface curved complementary to said round steel wire and said wire-engaging surface being tangent to one of said surfaces of the V-shaped groove.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,837,586	Rhodehamel	Dec. 22, 1931
2,233,621	Lovell	Mar. 4, 1941
2,263,485	Clopton	Nov. 18, 1941
2,277,305	Clopton	Mar. 24, 1942
2,288,862	Weitmann	July 7, 1942
2,420,802	Thompson	May 20, 1947

FOREIGN PATENTS

Number	Country	Date
585,259	Germany	Sept. 30, 1933
856,860	Italy	June 24, 1939