Aug. 6, 1940. R. MÜLLER-ERNESTI 2,210,770

MAGNETIC SOUND RECORDING

Filed Aug. 17, 1939

Fig. 1

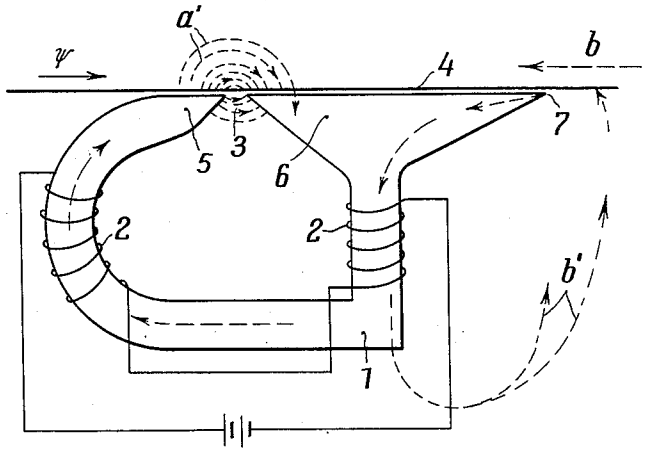
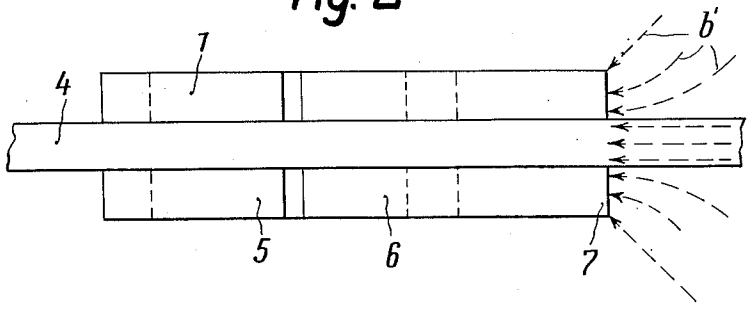


Fig. 2



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MAGNETIC SOUND RECORDING

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In Germany August 24, 1938

2 Claims. (Cl. 179—100.2)

This invention relates to magnetic sound recording and particularly to erasing heads or electromagnets for imparting a uniform magnetic condition to a telegraphone record carrier as it approaches the recording head or magnet.

Erasing heads have been employed that establish a saturating magnetic field and a weaker leakage field through which the record carrier passes in succession, the fields being in the longitudinal direction of the record carrier but of opposite sense. The two fields were obtained by forming the magnetic core with a pole piece, at the side of the core at which the record carrier departs from the core, that projects beyond its associated core leg and extends along the record carrier to terminate in a polar tip. In accordance with the usual design of other erasing magnets, the polar surfaces were made but slightly wider than the record carrier as it was thought that narrow polar surfaces and the attendant high flux densities would insure uniform results. It was observed, however, that low intensity noise or disturbing sounds would appear in the reproduction, thus indicating that the erasing system had not established an entirely uniform magnetic condition in all parts of the record carrier.

An object of the present invention is to provide a magnetic structure or erasing head that is more efficient and effective than the prior designs. An object is to provide an erasing head of the type in which a high intensity saturating field and a lower intensity leakage field act in succession on the record carrier, the erasing head having such width with respect to the record carrier that lateral fluctuations of the record carrier do not destroy the homogeneity of the leakage field. More specifically, an object is to provide an erasing head having polar surfaces of from two to four times the width of the record carrier that travels along the polar surfaces.

These and other objects and advantages of the invention will be apparent from the following specification when taken with the accompanying drawing in which:

Fig. 1 is a somewhat diagrammatic side elevation of an embodiment of the invention; and

Fig. 2 is a plan view of the same.

In the drawing, the reference numeral 1 identifies the approximately circular core of a magnet having a winding 2 for establishing a strong unidirectional magnetic field at the gap 3 across which the record carrier or band 4 travels in the direction indicated by the arrow x. The pole piece 5 at the approach side of the core has a flat surface along which the band 4 travels towards the gap 3, and the pole piece 6 at the departure side of the erasing magnet is extended along the band 4, beyond the associated core leg, to terminate in a polar tip 7.

The magnetic field at the gap 3 is in the direction indicated by the arrow a and several lines of force are indicated by the dotted lines a'. The field at the polar tip 7 is indicated generally by the arrow b and the paths of typical lines of force are shown by the lines b'.

As shown in Fig. 2, the width of the polar surfaces is approximately three times that of the record carrier 4, and the leakage field, as indicated by lines b', is substantially parallel to the direction of travel of the record carrier. Small lateral fluctuations of the record carrier do not destroy the homogeneity of the leakage field, and the magnetization characteristic of the carrier as it leaves the polar tip 7 is therefore substantially constant in spite of lateral fluctuations that cannot be entirely eliminated in a practical magnetic recorder.

The width ratio of 3 to 1 is not critical. Disturbing residiual noises will be substantially eliminated when the polar surfaces are twice the width of the record carrier if the lateral fluctuations are held to a low value. Increase of the polar width beyond about four times that of the record carrier will not add materially to the suppression of residual noise.

As illustrated, the polar surfaces are of uniform width but it will be apparent that the essential requirement is that the width of the polar tip 7 be adequate to insure a homogeneous leakage field. The width of the core at the gap 3 may be somewhat smaller, if desired, but it is usually preferable and economical to have constant width polar surfaces.

I claim:

1. In magnetic sound recording apparatus, an erasing head comprising a core having pole pieces spaced apart by a gap across which the record carrier travels, and a direct current winding on the core, the pole piece at the departure side of the core being extended along the record carrier to form a leakage polar tip having a width from two to four times the width of the record carrier.

2. In magnetic sound recording apparatus, an erasing head as claimed in claim 1, wherein each pole piece has a polar surface along which said record carrier travels, and said polar surfaces are of a constant width equal to from two to four times the width of the record carrier.

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