

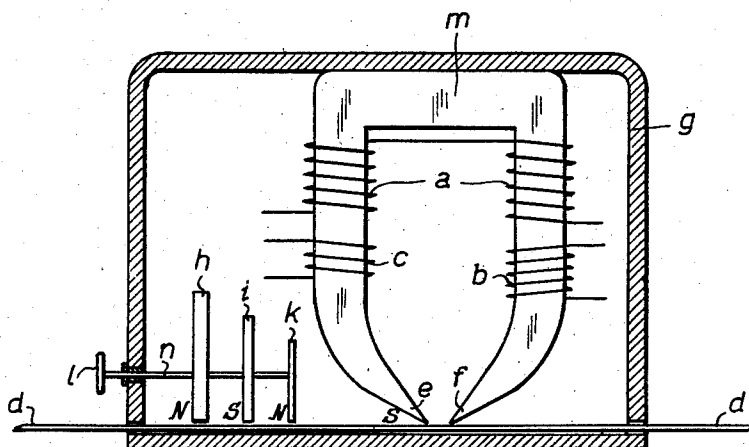
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DEVICE FOR DEMAGNETIZING THE MAGNETIZED WIRE OF A
SOUND RECORDING AND REPRODUCING APPARATUS

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DEVICE FOR DEMAGNETIZING THE MAGNETIZED WIRE OF A SOUND RECORDING AND REPRODUCING APPARATUS

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5 Claims. (Cl. 179—100.2)

The present invention relates to a device for demagnetizing the magnetized wire of a sound recording and reproducing device, in which the rewound but not yet demagnetized wire is passed near a plurality of permanent magnets or D.C. excited magnets arranged in line with changing polarity at small distances from each other whereby the wire is demagnetized previous to its passage near the sound head in order to be newly magnetized. The demagnetizing magnets are of decreasing field strength in direction of movement of the wire.

Heretofore, demagnetizing of the wire was effected by one D.C. magnet only, put in circuit ahead of the sound head. This sole magnet was sufficient for the demagnetizing but it did not remove small remanent fields remaining in the wire. These small residual fields interfered with the sound reproduction in that low frequency noises were superposed on the reproduced words or tones, which noises disadvantageously influenced the purity of reproduction.

It is a primary object of the present invention to provide a device which completely removes such noises. As mentioned above this device provides a row of D.C. magnets put in circuit ahead of the sound head and having successively, in the direction of movement of the wire, an opposite polarity and smaller field strength than the preceding magnet. Thus each point of the wire is repeatedly subjected to a slight reverse of magnetism whereby the remanent fields are weakened and finally practically removed. If such a device is provided the sound is reproduced without any interfering low frequency noises.

Other features and advantages of the invention will become apparent from the description now to follow of a preferred embodiment thereof given by way of example and in which reference will be made to the accompanying drawings showing in a sole figure a diagrammatic illustration of such a device.

In the drawings reference *g* designates the housing for the sound head magnet *m* the poles of which are designated by *e* and *f* respectively. Reference *a* designates the coil for the speaking current exciting the magnet *m*, while *b* designates the coil for a high-frequency current pre-exciting the magnet *m*. Reference *c* designates a coil for a direct current of small strength exciting the magnet *m* and reference *d* designates the steel wire to be first magnetized and then demagnetized. Finally references *h*, *i* and *k* designate D.C. magnets (or permanent magnets) of decreasing field strength, the field strength of *k* being smaller than the one of magnet *i* and the field strength of magnet *i* being smaller than the one of magnet *h*.

The poles of these magnets opposite the wire *d* follow each other with changing polarity. These magnets are mounted on a shaft rotatable by wheel 1 and the shaft *m* may be rotated to place the magnets in a position in which the wire *d* is no longer in the zone of action of their fields.

The described device operates as follows: If the re-

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wound but not yet demagnetized wire is to be advanced for a new recording, i.e. magnetizing, the three permanent magnets *h*, *i*, *k* are brought into the position illustrated in the drawing. The magnetized portions of the wire pass subsequently through the fields of these magnets, whereby the north pole of magnet *h* demagnetizes the wire but there will be small remanent fields remaining in the wire *d*. As the next field opposite the wire is the one of the south pole of magnet *i*, these residual fields are removed and replaced by new fields of opposite polarity and substantially smaller magnitude. These new fields are practically completely removed by the much smaller north pole field of magnet *k* and the now practically free wire *d* is ready for a new magnetizing which may then be reproduced without any interfering noises. The magnet *m* itself could help in the demagnetizing by exciting a coil *c* by a small direct current in the sense that pole *e* has the opposite polarity from the preceding magnet pole *k*. If the latter was the north pole, pole *e* should be a south pole of smaller strength than the north pole of magnet *k*. Instead of the exciting coil *c* also coil *a* may be taken for direct current excitation by superposing the very small exciting direct current to the speaking current. If electro-magnets are used for the magnets *h*, *i*, *k* the latter need not be mechanically rotatable as they may be activated or put out of effect by their exciting current on or off.

I claim:

1. For use in a magnetic recording and reproducing apparatus, a device for demagnetizing a record carrier comprising, in combination, means for moving said record carrier past a demagnetizing station; a series of bar magnets located at said demagnetizing station, said bar magnets extending substantially normally to the moving record carrier and being aligned with each other in such a manner that the record carrier passes through a series of successive magnetic fields of opposite polarity with each field being weaker than the preceding one; and mounting means operatively associated with said bar magnets for enabling said series of magnets to be moved between a position wherein they extend substantially normally to the moving record carrier and are aligned with each other in said manner and another position in which the magnetic fields generated by said magnets have no effect upon the record carrier moving past said station.

2. For use in a magnetic recording and reproducing apparatus, a device for demagnetizing a record carrier comprising, in combination, means for moving said record carrier past a demagnetizing station; a series of bar magnets located at said demagnetizing station, said bar magnets extending substantially normally to the moving record carrier and being aligned with each other in such a manner that the record carrier passes through a series of successive magnetic fields of opposite polarity with each field being weaker than the preceding one; and mounting means operatively associated with said bar magnets for enabling said series of magnets to be moved between a position wherein they extend substantially normally to the moving record carrier and are aligned with each other in said manner and another position in which the magnetic fields generated by said magnets have no effect upon the record carrier moving past said station, said mounting means including a turnable shaft extending in a plane containing said aligned bar magnets and being attached thereto, whereby said series of bar magnets may be turned simultaneously between said positions.

3. For use in a magnetic recording and reproducing apparatus having a recording head in the form of an electromagnet which generates an electromagnetic field capable of impressing a record upon a record carrier, a

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device for demagnetizing said record carrier, comprising, in combination, means for moving said record carrier past a demagnetizing station and thereafter past said recording head; a series of magnets located at said demagnetizing station and being so arranged that said record carrier passes through a series of successive magnetic fields of opposite polarity with each succeeding field being weaker than the preceding one; and means operatively associated with said recording head for superimposing thereon such magnetization that the same produces an electromagnetic field which is of a polarity opposite to that of the last of said successive magnetic fields and which is weaker than said last successive magnetic field.

4. For use in a magnetic recording and reproducing apparatus having a recording head in the form of an electromagnet which generates an electromagnetic field capable of impressing a record upon a record carrier, said electromagnet having leading and trailing poles, a device for demagnetizing said record carrier, comprising, in combination, means for moving said record carrier past a demagnetizing station and thereafter past said recording head; a series of magnets located at said demagnetizing station and being so arranged that said record carrier passes through a series of successive magnetic fields of opposite polarity with each succeeding field being weaker than the preceding one; and additional means operatively associated with said recording head for superimposing thereon such magnetization that said leading pole thereof produces an electromagnetic field which is of a polarity opposite to that of the last of said successive magnetic fields and which is weaker than said last successive magnetic field, said additional means including a coil on said recording head and means for energizing said coil with direct current.

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5. For use in a magnetic recording and reproducing apparatus having a recording head in the form of an electromagnet which generates an electromagnetic field capable of impressing a record upon a record carrier, said electromagnet having leading and trailing poles and including a coil through which a signal current is passed, a device for demagnetizing said record carrier, comprising, in combination, means for moving said record carrier past a demagnetizing station and thereafter past said recording head; a series of magnets located at said demagnetizing station and being so arranged that said record carrier passes through a series of successive magnetic fields of opposite polarity with each succeeding field being weaker than the preceding one; and additional means operatively associated with said recording head for superimposing thereon such magnetization that said leading pole thereof produces an electromagnetic field which is of a polarity opposite to that of the last of said successive magnetic fields and which is weaker than said last successive magnetic field, said additional means including energizing means electrically connected to said coil of said recording head.

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