the electrode layers **116** and **116** is increased, reducing the direct current resistance (DCR) and thereby improving the reproduction characteristics.

[**0376**] Furthermore, the electrode layers **116** and **116**, respectively extending over the insensitive regions D and D, prevent the sense current flowing into the insensitive regions D and D, thereby controlling the generation of noise.

[**0377**] Referring to **FIG. 13**, the width dimension T**54** of each of the electrode layers **116** and **116** extending over the insensitive regions D and D of the multilayer film **203** preferably falls within a range from 0 μm to 0.08 μm. More preferably, the width dimension T**54** falls within a range from 0.05 μm to 0.08 μm.

[**0378**] The angle θ**13** made between the top surface of the multilayer film **203** with the protective layer **15** removed, namely, the top surface **112***a* of the antiferromagnetic layer **112** in **FIG. 13**, and an end face **116***a* of the electrode layer **116** extending over the insensitive region of the multilayer film **203** is preferably 20 degrees or greater, and more preferably 25 degrees or greater. This arrangement prevents the sense current from shunting into. the insensitive region, thereby controlling the generation of noise.

[**0379**] To prevent a short which is likely to occur between the electrode layers **116** and **116** and a top shield layer when the top shield layer is deposited over the protective layer **15** and the electrode layers **116** and **116**, the angle θ**13** made between the top surface **112***a* and the end face **116***a* is preferably 60 degrees or smaller, and more preferably, 45 degrees or smaller.

[**0380**] Referring to **FIG. 13, a** magnetic coupling junction M between the multilayer film **203** and each of the hard bias layers **114** and **114** is fabricated of an interface with the end face of only the first free magnetic layer **105**, of both the first free magnetic layer **105** and the second free magnetic layer **107**. This arrangement controls the disturbance in the magnetization direction on both end portions in each of the free magnetic layers, permitting the width dimension T**52** of the sensitive region E to be enlarged.

[**0381**] As shown in **FIG. 13**, the protective layer **15** is formed where the multilayer film **203** has no electrode layers **116** and **116** deposited thereon. The electrode layers **116** and **116** are connected to the antiferromagnetic layer **112** with no protective layer **15** interposed therebetween.

[**0382**] This arrangement presents a smaller electrical resistance than the arrangement in which the electrode layers **116** and **116** are deposited on the protective layer **15**, improving the characteristics of the magnetoresistive-effect device.

[**0383**] **FIG. 14** is a cross-sectional view of the magnetoresistive-effect device of a fourteenth embodiment of the present invention, viewed from an ABS side thereof.

[**0384**] A magnetoresistive-effect device shown in **FIG. 14** is an AMR (anisotropic magnetoresistive) device, and its layer structure is identical to that of the AMR device shown in **FIG. 8**.

[**0385**] In this embodiment again, the sensitive region E and the insensitive regions D and D of the multilayer film **61** are measured using the micro track profile method. The portion, having the width dimension T19, centrally positioned on a multilayer film **61** is the sensitive region E, and the portions, each having the width dimension T20, are the insensitive regions D and D.

[**0386**] The difference of the AMR device shown in **FIG. 14** from the AMR device shown in **FIG. 8** lies in that a protective layer **55** is formed where the multilayer film **61** has no junction with electrode layers **120** and **120** and that a magnetoresistive layer **54** is directly connected to the electrode layers **120** and **120** with no protective layer **55** interposed therebetween.

[**0387**] This arrangement presents a smaller electrical resistance than the arrangement in which the electrode layers **120** and **120** are laminated on the protective layer **55**, improving the characteristics of the magnetoresistive-effect device.

[**0388**] Referring to **FIG. 14**, the electrode layers **120** and **120** are formed to extend over the multilayer film **61**. The width dimension of the top surface of the multilayer film **61** having no electrode layer **120** thereon is the optical read track width O-Tw, and the width dimension of the sensitive region E not covered with the electrode layer **120** is the magnetic read track width M-Tw. In this embodiment, the electrode layers **120** and **120** extending over the multilayer film **61** fully cover the insensitive regions D and D. The optical read track width O-Tw is thus approximately equal to the magnetic read track width M-Tw.

[**0389**] It is not a requirement that the electrode layers **120** and **120** fully cover the insensitive regions D and D, and the width dimension T**55** of the electrode layer **120** extending over the multilayer film **61** is smaller than the insensitive region D. In this case, the optical read track width O-Tw becomes larger than the magnetic read track width M-Tw.

[**0390**] The width dimension T**55** of each of the electrode layers **120** and **120** extending over the insensitive regions D and D of the multilayer film **61** preferably falls within a range from 0 μm to 0.08 μm. More preferably, the width dimension T21 falls within a range from 0.05 μm to 0.08 μm.

[**0391**] The angle θ**14** made between the top surface **54***a* of the magnetoresistive layer and an end face **120***a* of the electrode layer **120** extending over the insensitive region of the multilayer film **61** is preferably 20 degrees or greater, and more preferably 25 degrees or greater. This arrangement prevents the sense current from shunting into the insensitive region, thereby controlling the generation of noise.

[**0392**] If the angle θ**14** made between the top surface **54***a* and the end face **120***a* is too large, a short is likely to occur between the electrode layer **120** and a top shield layer of a soft magnetic material when the top shield layer is deposited over the protective layer **55** and the electrode layers **120** and **120**. The angle θ**14** made between the top surface **54***a* and the end face **120***a* is preferably 60 degrees or smaller, and more preferably, 45 degrees or smaller.

[**0393**] In the AMR device, the hard bias layers **56** and **56** are magnetized in the X direction as shown, and the magnetoresistive layer **54** is supplied with the bias magnetic field in the X direction by the hard bias layers **56** and **56**. Furthermore, the magnetoresistive layer **54** is supplied with the bias field in the Y direction by the soft magnetic layer **52**. With the magnetoresistive layer **54** supplied with the bias magnetic fields in the X direction and Y direction, a variation