to be larger than the width dimension T30 of the top surface of the multilayer film **16** shown in **FIG. 1**. The width dimension of the sensitive region E of the multilayer film **21** is thus larger than the width dimension T2 of the sensitive region E shown in **FIG. 1**.

[**0180**] Also referring to **FIG. 3**, the electrode layers **18** and **18** are formed to extend over the multilayer film **21** on both sides thereof by a width dimension T7, covering the insensitive regions D and D of the multilayer film **21**. The width dimension T7 of each of the electrode layers **18** and **18** preferably falls within a range from 0 μm to 0.08 μm. More preferably, the width dimension T7 falls within a range from 0.05 μm to 0.08 μm.

[**0181**] In the third embodiment, the electrode layers **18** and **18** deposited above the multilayer film **21** partly cover the insensitive regions D and D, rather than fully covering them. Specifically, as shown in **FIG. 3**, the optical read track width dimension O-Tw, determined by the width dimension of the top surface of the multilayer film **21** not covered with the electrode layers **18** and **18**, is set to be larger than the magnetic read track width M-Tw determined by the width dimension of the sensitive region E not covered with the electrode layers **18** and **18**. In this embodiment again, the electrode layers **18** and **18** may fully cover the insensitive regions D and D on the multilayer film **21**, thereby setting the optical read track width O-Tw and the magnetic read track width M-Tw (i.e., the width dimension of the sensitive region E) to approximately the same dimension.

[**0182**] The angle θ**3** made between the top surface **15***a* of the protective layer **15** and an end face **18***a* of the electrode layer **18** extending over the insensitive region of the multilayer film **21** 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.

[**0183**] If the angle θ**3** made between the top surface **15***a* and the end face **18***a* is too large, a short is likely to occur between the electrode layer **18** and a top shield layer of a soft magnetic material when the top shield layer is deposited over the protective layer **15** and the electrode layers **18** and **18**. The angle θ**3** made between the top surface **15***a* and the end face **18***a* is preferably 60 degrees or smaller, and more preferably, 45 degrees or smaller.

[**0184**] **FIG. 4** is a cross-sectional view showing the construction of the magnetoresistive-effect device of a fourth embodiment of the present invention, viewed from an ABS side thereof.

[**0185**] A spin-valve type thin-film device shown in **FIG. 4** has an antiferromagnetic layer **30** formed and extending on and along the substrate **10** in the X direction. The antiferromagnetic layer **30** is projected upward by a height dimension dl on the center of the device along the X direction. A pinned magnetic layer **31**, a nonmagnetic electrically conductive layer **32**, a free magnetic layer **33**, and a protective layer **15** are successively laminated on the projected antiferromagnetic layer **30**. The laminate, composed of the layers from the substrate **10** through the protective layer **15**, forms a multilayer film **35**.

[**0186**] In the present invention, the antiferromagnetic layer **30** is made of a Pt—Mn (platinum-manganese) alloy. Instead of the Pt—Mn alloy film, the antiferromagnetic layer **30** may be made of an X—Mn alloy where X is a material selected from the group consisting of Pd, Ir, Rh, Ru, and alloys thereof, or a Pt—Mn—X' alloy where X' is a material selected from the group consisting of Pd, Ir, Rh, Ru, Au, Ag, and alloys thereof.

[**0187**] The pinned magnetic layer **31** and the free magnetic layer **33** are made of an Ni—Fe (nickel-iron) alloy, Co (cobalt), an Fe—Co (iron-cobalt) alloy, or an Fe—Co—Ni alloy, and the nonmagnetic electrically conductive layer **32** is made of a low electrical-resistance nonmagnetic electrically conductive material, such as Cu (copper).

[**0188**] Referring to **FIG. 4**, metallic layers **36** and **36**, made of Cr or the like, and functioning as a buffer layer or a alignment layer, extend from a horizontal portion thereof coextending a width dimension T8 of the antiferromagnetic layer **30** in the X direction, rising along the side end faces of the pinned magnetic layer **31**, the nonmagnetic electrically conductive layer **32**, and the free magnetic layer **33**. The use of the metallic layer **36** helps increase the strength of the bias magnetic field created by hard bias layers **37** and **37**.

[**0189**] Deposited on top of the metallic layers **36** and **36** are the hard bias layers **37** and **37** which are made of a Co—Pt (cobalt-platinum) alloy or a Co—Cr—Pt (cobalt-chromium-platinum) alloy.

[**0190**] The hard bias layers **37** and **37** are magnetized in the X direction (i.e., the direction of the track width) as shown, and the magnetization direction of the free magnetic layer **33** is thus aligned in the X direction under the bias field in the X direction caused by the hard bias layers **37** and **37**.

[**0191**] Since the antiferromagnetic layer **30** extends beneath and along the hard bias layers **37** and **37** as shown in **FIG. 4**, the thickness of the hard bias layers **37** and **37** can be made thinner. The hard bias layers **37** and **37** are thus easily produced using a sputtering technique.

[**0192**] Intermediate layers **38** and **38**, made of a nonmagnetic material, such as Ta, are respectively deposited on the hard bias layers **37** and **37**. Electrode layers **39** and **39**, made of Cr, Au, Ta, or W, are respectively deposited on top of the intermediate layers **38** and **38**.

[**0193**] In the fourth embodiment again, the sensitive region E and the insensitive regions D and D of the multilayer film **35** are measured using the micro track profile method. Referring to **FIG. 4**, the portion of the multilayer film **35** having a width dimension T9 represents the sensitive region E, and the portion having a width dimension T10 represents each of the insensitive regions D and D.

[**0194**] In the sensitive region E, the magnetization direction of the pinned magnetic layer **31** is pinned correctly parallel to the Y direction, and the magnetization direction of the free magnetic layer **33** is correctly aligned in the X direction. The pinned magnetic layer **31** and the free magnetic layer **33** are thus perpendicular in magnetization direction. The magnetization of the free magnetic layer **33** varies sensitively in response to an external magnetic field from the recording medium. An electrical resistance varies in accordance with the relationship between the variation in the magnetization direction of the free magnetic layer **33** and the pinned magnetic field of the pinned magnetic layer **31**. A leakage magnetic field from the recording medium is thus