layer **18** extending over the insensitive region of the multilayer film **16** 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.

[0167] If the angle θ1 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 θ1 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.

[0168] A spin-valve type thin-film device shown in **FIG. 2** also includes a multilayer film **20** composed of a substrate **10**, an antiferromagnetic layer **11**, a pinned magnetic layer **12**, a nonmagnetic electrically conductive layer **13**, a free magnetic layer **14**, and a protective layer **15**, hard bias layers **17** and **17** deposited on both sides of the multilayer film **20**, and electrode layers **18** and **18** respectively deposited on the hard bias layers **17** and **17**. Each electrode layer **18** is formed to extend over the multilayer film **20** by a width dimension of T5. The electrode layers **18** and **18** extending over the multilayer film **20** fully cover the insensitive regions D and D. In this case, an optical read track width O-Tw determined by the width dimension of the top surface of the multilayer film **20** is approximately equal to the magnetic read track width dimension M-Tw (i.e., the width dimension of the sensitive region E) determined by the width dimension of the sensitive region E not covered by the electrode layers **18** and **18**.

[0169] It is not a requirement that the electrode layer **18** fully cover the insensitive region D. The width dimension T5 of the electrode layer **18** extending over the multilayer film **20** may be smaller than the insensitive region D. In this case, the optical read track width O-Tw is larger than the magnetic read track width M-Tw. The width dimension T5 of the electrode layer **18** is preferably within a range from 0 μm to 0.08 μm, and more preferably within a range from 0.05 μm to 0.08 μm. Within these ranges, the direct current resistance is successfully reduced while the reproduction output is free from noise.

[0170] In the second embodiment shown in **FIG. 2**, the width dimension of the top surface of the multilayer film **20** is T**31**, which is larger than the width dimension T30 of the multilayer film **16** shown in **FIG. 1**. The multilayer film **20** provides a wider sensitive region E capable of substantially exhibiting the magnetoresistive effect than the multilayer film **16** shown in **FIG. 1**. The width dimension of the sensitive region E shown in **FIG. 2** is approximately equal to the width dimension T30 on the top surface of the multilayer film **16** shown in **FIG. 1**.

[0171] By enlarging the width dimension of the multilayer film **20**, the influence by the hard bias layers **17** and **17** is reduced, and the width dimension of the sensitive region E capable of substantially exhibiting the magnetoresistive effect is set to be larger than that of the multilayer film **16** shown in **FIG. 1**. This is because the width dimension of each of the insensitive regions D and D falls within a certain range regardless of the width dimension T31 of the top surface of the multilayer film **20**. For this reason, by setting the width dimension of the multilayer film **20** to any arbitrary dimension, the width dimension of the sensitive region E, i.e., the magnetic read track width M-Tw is also set to be any arbitrary dimension.

[0172] More specifically, even if the top surface of the multilayer film **16** is sized to be T30, the portion capable of substantially exhibiting the magnetoresistive effect is limited to the sensitive region D having the width dimension T2 as shown in **FIG. 1**. The second embodiment shown in **FIG. 2** is chiefly intended to enlarge the width dimension of the sensitive region E to be larger than the width dimension T2 of the sensitive region E shown in **FIG. 1**. The width dimension of the top surface of the multilayer film **20** is enlarged to T**31** to this end.

[0173] The angle θ**2** 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 **20** 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.

[0174] If the angle θ2 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 θ2 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.

[0175] A multilayer film **21** in a spin-valve type thin-film device of a third embodiment of the present invention shown in **FIG. 3** has an inverted order of the lamination of the multilayer film **20** of the spin-valve type thin-film device shown in **FIG. 2**. Specifically, a free magnetic layer **14**, a nonmagnetic electrically conductive layer **13**, a pinned magnetic layer **12**, and an antiferromagnetic layer **11** are successively laminated from the substrate **10** as shown in **FIG. 3**.

[0176] In the third embodiment, the free magnetic layer **14** of the multilayer film **21** shown in **FIG. 3** is formed beneath the antiferromagnetic layer **11**, and is in contact with the thick portion of the hard bias layers **17** and **17**. The magnetization of the free magnetic layer **14** is thus easily aligned in the X direction. The generation of Barkhausen noise is thus controlled.

[0177] Referring to **FIG. 3**, the height position of the upper edge of the magnetic coupling junction M between the multilayer film **21** and the hard bias layers **17** and **17** in the direction of the advance of the recording medium (i.e., the Z direction in **FIG. 3**) is at the same level as the height position of the top surface of the free magnetic layer **14** in the direction of the advance of the recording medium.

[0178] It is sufficient if the hard bias layers **17** and **17** are magnetically coupled with the free magnetic layer **14** only. Since the hard bias layers **17** and **17** are magnetically uncoupled with the pinned magnetic layer **12** as shown in **FIG. 3**, the influence of the magnetic field created by the hard bias layers **17** and **17** on the magnetization direction of the pinned magnetic layer **12** is controlled.

[0179] In the third embodiment again, the width dimension of the top surface of the multilayer film **21** is enlarged