[0040] A protective layer, constructed of Ta, etc., is preferably deposited, as a top layer, on top of the multilayer film to prevent oxidation.

[0041] An electrode layer, if laminated on the protective layer, adversely affects the characteristics of the magnetoresistive-effect device, for example, increases an electrical resistance. Therefore, the protective layer is preferably deposited where there is no junction between the multilayer film and the electrode layer.

[0042] The sensitive region of the multilayer film is defined as a region which results in an output equal to or greater than 50% of a maximum reproduction output while the insensitive regions of the multilayer film are defined as regions, formed on both sides of the sensitive region, which result in an output smaller than 50% of the maximum reproduction output, when the magnetoresistive-effect device having the electrode layers on both sides only of the multilayer film scans a micro track, having a signal recorded thereon, in the direction of a track width.

[0043] The width dimension of the sensitive region of the multilayer film is preferably equal to an optical track width O-Tw.

[0044] The width dimension of a portion of each electrode layer extending over the multilayer film is preferably within a range from 0 μm to 0.08 μm.

[0045] The width dimension of the portion of each electrode layer extending over the multilayer film is preferably equal to or larger than 0.05 μm.

[0046] The angle made between the surface of the protective layer or the surface of the multilayer film with the protective layer removed therefrom and the end face of the electrode layer extending over the insensitive region of the multilayer film is preferably within a range of 20 degrees to 60 degrees, and more preferably within a range of 25 degrees to 45 degrees.

[0047] An insulator layer is preferably deposited between the electrode layers, which are deposited above and on both sides of the multilayer film, and the end face of the insulator layer is in direct contact with each of the electrode layers or is separated from each of the electrode layers by a layer.

[0048] The angle made between the surface of the protective layer or the surface of the multilayer film with the protective layer removed therefrom and the end face of the electrode layer extending over the insensitive region of the multilayer film is preferably 60 degrees or greater, and more preferably 90 degrees or greater.

[0049] The width dimension of a portion of each electrode layer extending over the multilayer film is preferably substantially equal to the width dimension of the insensitive region of the multilayer film.

[0050] According to a fourth aspect of the present invention, a method for manufacturing a magnetoresistive-effect device includes the steps of laminating, on a substrate, a multilayer film for exhibiting the magnetoresistive effect, depositing, on a sensitive region of the multilayer film, a lift-off resist layer having an undercut on the underside thereof facing insensitive regions of the multilayer film with the sensitive and insensitive regions beforehand measured through a micro track profile method, depositing bias layers on both sides of the multilayer film and magnetizing the bias layer in the direction of a track width, depositing an electrode layer on the bias layer at a slant angle with respect to the multilayer film, with the electrode layer formed into the undercut on the underside of the resist layer arranged on the multilayer film, and removing the resist layer from the multilayer film.

[0051] When a protective layer is deposited as a top layer on the multilayer film for oxidation prevention in the step of laminating, on the substrate, the multilayer film for exhibiting the magnetoresistive effect, the method preferably includes the steps of depositing the lift-off resist layer on top of the protective layer in the sensitive region of the multilayer film, in the step of depositing the lift-off resist layer on the sensitive region of the multilayer film, and exposing the underlayer beneath the protective layer by removing a portion of the protective layer which is not in direct contact with the lift-off resist layer. In this way, the electrode layer advantageously joins the multilayer film where the protective layer having a high electrical resistance is removed, when the electrode layer is deposited to extend over the multilayer film.

[0052] In the step of depositing the electrode layer, the angle made between the surface of the protective layer or the surface of the multilayer film with the protective layer removed therefrom and the end face of the electrode layer extending over the insensitive region of the multilayer film is preferably within a range of 20 degrees to 60 degrees, and more preferably within a range of 25 degrees to 45 degrees.

[0053] According to a fifth aspect of the present invention, a method for manufacturing a magnetoresistive-effect device includes the steps of laminating, on a substrate, a multilayer film for exhibiting the magnetoresistive effect, depositing an insulator layer on the multilayer film, depositing, on the insulator layer in a sensitive region of the multilayer film, a lift-off resist layer having an undercut on the underside thereof facing insensitive regions of the multilayer film with the insensitive regions beforehand measured through a micro track profile method, removing the insulator layer deep to the undercut formed on the underside of the resist layer, through etching, depositing bias layers on both sides of the multilayer film and magnetizing the bias layers in the direction of a track width, depositing an electrode layer on the bias layer at a slant angle with respect to the multilayer film, with the electrode layer formed to be in direct contact with an end face of the insulator layer, i.e., the underlayer beneath the resist layer, or with the electrode layer formed to be separated from the end face of the insulator layer by a layer, and removing the resist layer from the insulator layer.

[0054] When a protective layer is deposited as a top layer on the multilayer film for oxidation prevention in the step of depositing, on the substrate, the multilayer film for exhibiting the magnetoresistive effect, the method preferably includes the step of removing the area of the protective layer not covered with the insulator layer to expose the underlayer beneath the protective layer, subsequent to the step of removing the insulator layer deep to the undercut formed on the underside of the resist layer through etching. In this way, the electrode layer advantageously joins the multilayer film where the protective layer having a high electrical resistance is removed, when the electrode layer is formed to extend over the multilayer film.