

~~SUMMARY OF THE INVENTION~~

~~PROBLEM TO BE SOLVED BY THE INVENTION~~

[0006] However, the magnetic recording discs of recent perpendicular recording systems are increasingly required to be smoother, that is, to minimize scratches. Further, these conventional proposals merely describe general needle punching conditions common to general artificial leathers comprising nonwoven fabrics. That is, it is desired to set the optimum conditions for forming the surface fiber-napped portion structures on the surface of the polishing cloth and the universal needle punching conditions for obtaining a surface capable of maintaining sufficient dispersibility.

[0007] In view of the abovementioned conventional problems, an object of ~~this invention~~the embodiments disclosed herein is to provide a polishing cloth giving less scratch defects than those of the conventional polishing cloth comprising ultrafine fibers at the time of polishing and having high performance of allowing highly precise polishing.

[0008] Another object of ~~this invention~~the embodiments disclosed herein is to provide a method for efficiently producing the abovementioned polishing cloth.

~~MEANS FOR SOLVING THE PROBLEM~~

[0009] This ~~invention~~disclosure is intended to solve the abovementioned problem. The polishing cloth of this ~~invention~~disclosure mainly comprises a nonwoven fabric formed by entangling the ultrafine fiber bundles formed by bundling ultrafine fibers with an average single fiber diameter of 0.05 to 2.0 μm and a polymeric elastic material, wherein the average size of the surface fiber-napped portions constituted by the aforementioned ultrafine fiber bundles of the aforementioned nonwoven fabric in the width direction of the ultrafine fiber bundles is 50 to 180 μm .

[0010] In a preferred mode of the polishing cloth of this ~~disclosure~~invention, the average size of the aforementioned surface fiber-napped portions in the width direction of the ultrafine fiber bundles is 50 to 120 μm .

[0011] In a preferred mode of the polishing cloth of this ~~invention~~disclosure, the surface roughness of the polishing cloth is 5 to 18 μm .

[0012] In a preferred mode of the polishing cloth of this ~~invention~~disclosure, the CV value of the aforementioned ultrafine fibers is 1 to 30%.

[0013] Further, the method for producing the polishing cloth of this ~~invention~~disclosure comprises at least the following steps (1) through (5) in combination, wherein the number of islands-in-sea type composite fibers convertible into ultrafine fibers, which are brought in by the needle punching of the following step (2), is 3 to 6 fibers/1 barb:

- (1) a step of producing islands-in-sea type composite fibers convertible into ultrafine fibers with an average single fiber fineness of 0.05 to 2.0 μm ;
- (2) a step of forming and laminating fiber webs by a card and a crosslapper using said

- islands-in-sea type composite fibers, and obtaining a nonwoven fabric by needle punching;
- (3) a step of giving a polymeric elastic material to said nonwoven fabric by 10 to 200 mass% based on the mass of the ultrafine fibers obtained by converting the composite fibers;
- (4) a step of buffing at least one surface; and
- (5) a step of converting said islands-in-sea type composite fibers into ultrafine fibers.

[0013a] In an aspect, there is provided a method for producing a polishing cloth mainly comprising a nonwoven fabric formed by entangling the ultrafine fiber bundles including ultrafine fibers with an average single fiber diameter of 0.05 to 2.0 μm and a polymeric elastic material, wherein the average size of the surface fiber-napped portions constituted by the aforementioned ultrafine fiber bundles is 20 to 180 μm , comprising at least the following steps (1) through (6) in combination, wherein the number of islands-in-sea type composite fibers convertible into ultrafine fibers, which can be brought in by the needle punching of the following step (2), is 3 to 6 fibers/1 barb:

- (1) a step of producing islands-in-sea type composite fibers convertible into ultrafine fibers with an average single fiber diameter of 0.05 to 2.0 μm ;
- (2) a step of laminating fiber webs by a card and a crosslapper using said islands-in-sea type composite fibers, and obtaining a nonwoven fabric by needle punching;
- (3) a step of shrinking said nonwoven fabric by hot water, to have a higher fiber density from the view point of denser surface fibers;
- (4) a step of giving a polymeric elastic material to said nonwoven fabric by 10 to 200 mass% based on the mass of the ultrafine fibers obtained by converting the composite fibers;
- (5) a step of buffing at least one surface; and
- (6) a step of converting said islands-in-sea type composite fibers into ultrafine fibers.

[0014] In a preferred mode of the method for producing the polishing cloth of this ~~disclosure~~~~invention~~, the number of the islands-in-sea type composite fibers convertible into ultrafine fibers, which are brought in by the needle punching of the step (2), is 3 to 4 fibers/1 barb.

EFFECT OF THE INVENTION

[0015] According to this ~~invention~~~~disclosure~~, a polishing cloth smaller in the size of the surface fiber-napped portions comprising ultrafine fiber bundles in the width direction of the ultrafine fiber bundles and more excellent in smoothness than the conventional polishing cloth can be obtained. Therefore, a high-performance polishing cloth that can make the scratches and the surface roughness of the polished material small when used as a tape-like polishing cloth in the slurry grinding and/or slurry cleaning of the substrate surface of a recording disc, can be obtained.

[0016] The polishing cloth ~~as defined above of this invention~~ can be suitably used for polishing and/or cleaning the aluminum alloy substrate or glass substrate of a magnetic disc in ultrahigh precision finishing.

[0017] The production method ~~of this invention~~ as defined above allows the abovementioned polishing cloth to be produced efficiently.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] [Fig. 1] Fig. 1 is an enlarged SEM photo (40x) as a substitute for a drawing showing an example of the polishing cloth surface of this invention.

[Fig. 2] Fig. 2 is a typical view showing the relation between a needle and composite fibers at the time of needle punching for explaining the method for estimating the number of composite fibers brought in at the time of needle punching.

MODES FOR CARRYING OUT THE INVENTION

[0019] With regard to the polishing cloth of this invention and the production method thereof, modes for carrying out the invention are explained below.

[0020] With regard to the aforementioned problem, i.e., the problem of making small the scratch defects on the substrate surface and the surface roughness of the polished material, the inventors made an intensive study on the surface fiber-napped portion structures comprising ultrafine fiber bundles on the surface of the polishing cloth by paying attention to the size in the width direction, of the portions where the ultrafine fibers constituting the ultrafine fiber bundles are disposed substantially uniformly in the length direction and aligned in one direction, and also to the surface smoothness. Thus, the inventors found that the denseness