

FIG. 3 is a flowchart illustrating a method for manufacturing a glass substrate according to an embodiment.

FIG. 4 is a partial perspective view of a double-side polishing device that is used in a polishing step.

5 FIG. 5 is a flowchart illustrating a breakdown of a second polishing step of the method for manufacturing a glass substrate for an information recording medium according to the embodiment.

FIG. 6 is an enlarged vertical sectional view of a lower-side polishing pad of a background art.

10 FIG. 7 is an enlarged vertical sectional view of a lower-side polishing pad of the embodiment.

FIG. 8 shows the defect inspection results and the read/write test results with respect to Working Examples 1 to 45 and Comparative Examples 1 to 3.

15 [Description of Embodiments]

[0022] Hereinafter, an embodiment and examples based on the present invention will be described with reference to the drawings. When numbers, amounts, and so on are referred to in the following description of the embodiment and examples, the scope of the present invention is not necessarily
20 limited to those numbers, amounts, and so on, unless explicitly mentioned otherwise. In the following description of the embodiment and examples, identical or equivalent parts are denoted by identical reference numerals, and descriptions thereof may be omitted.

[0023] (Glass substrate 1 · magnetic disk 10)

25 First, a glass substrate 1 to be obtained by a method for manufacturing a glass substrate for an information recording medium based on the present embodiment as well as a magnetic disk 10 including the glass substrate 1 will be described with reference to FIGS. 1 and 2. FIG. 1 is a perspective view showing the glass substrate 1 for use in the magnetic disk 10 (see FIG. 2). FIG.
30 2 is a perspective view showing the magnetic disk 10 including the glass

layer can be continuously formed using an inline-type sputtering device. The protecting layer may be a single layer or have a multilayer configuration constituted by the same type or different types of layers.

[0034] Another protecting layer may be formed on the above protecting layer or instead of the above protecting layer. For example, instead of the above protecting layer, a silicon oxide (SiO_2) layer may be formed by applying a solution obtained by diluting tetraalkoxysilane with an alcohol-based solvent and dispersing colloidal silica minute particles therein on a Cr layer, and by firing the Cr layer.

10 [0035] (Method for manufacturing glass substrate)

Next, a method for manufacturing a glass substrate for an information recording medium (hereinafter simply referred to as "glass substrate") according to the present embodiment will be described using a flowchart shown in FIG. 3. FIG. 3 is the flowchart illustrating the method for manufacturing the glass substrate 1 according to the present embodiment.

[0036] The method for manufacturing a glass substrate according to the present embodiment includes a glass blank material preparing step (step S10), a glass substrate forming/grinding step (step S20), a polishing step (step S30), a chemical strengthening step (step S40), and a cleaning step (step S50). A glass substrate (corresponding to the glass substrate 1 in FIG. 1) that is obtained through the chemical strengthening ~~treatment~~ step (step S40) may also be subjected to a magnetic thin film forming step (step S60). The magnetic disk 10 serving as an information recording medium is obtained by the magnetic thin film forming step (step S60).

25 [0037] Hereinafter, details of the steps S10 to S60 will be described sequentially. In the following description, simplified cleaning that may be appropriately performed between the steps S10 to S60 is not described.

[0038] (Glass blank material preparing step)

In the glass blank material preparing step (step S10), a glass material constituting the glass substrate is melted (step S11). For example, common

For the glass substrates of Working Example 1, the attraction force was 15.0 g/cm², the number of communication holes in each polishing pad was 35, the slurry was accumulated on the polishing pads in the glass substrate removing step (S334), and the concentration of the slurry at that time was 15 wt%. The cleaning step was performed after the end of the polishing step (S333) and before the glass substrate removing step (S334). With respect to Working Example 1, the evaluation result of the defect inspection was "B", and the evaluation result of the read/write test was "B". The number of communication holes in each polishing pad means the number of communication holes having a cross-sectional area S of 0.01 mm² or more that are present per 25 mm² of a vertical section of the lower-side polishing pad 410 and of the upper-side polishing pad 310 taken in the direction of a normal to the lower surface plate 400. The same applies hereinafter.

[0083] (Working Example 2)

For the glass substrates of Working Example 2, the attraction force was 14.5 g/cm², the number of communication holes in each polishing pad was 35, the slurry was accumulated on the polishing pads in the glass substrate removing step (S334), and the concentration of the slurry at that time was 20 wt%. No cleaning step was performed after the end of the polishing step (S333) and before the glass substrate removing step (S334). In Working Example 2, a slurry having a high concentration was sprayed onto the polishing pads after the end of the polishing step (S333) and before the glass substrate removing step (S334). With respect to Working Example 2, the evaluation result of the defect inspection was "B", and the evaluation result of the read/write test was "B".

[0084] (Working Example 3)

For the glass substrates of Working Example 3, the attraction force was 13.0 g/cm², the number of communication holes in each polishing pad was 35, the slurry was accumulated on the polishing pads in the glass substrate removing step (S334), and the concentration of the slurry at that time was 25

wt%. No cleaning step was performed after the end of the polishing step (S333) and before the glass substrate removing step (S334). In Working Example 3, a slurry having a high concentration was sprayed onto the polishing pads after the end of the polishing step (S333) and before the glass substrate removing step (S334). With respect to Working Example 3, the evaluation result of the defect inspection was "A", and the evaluation result of the read/write test was "A".

[0085] (Working Example 4)

For the glass substrates of Working Example 4, the attraction force was 14.0 g/cm², the number of communication holes in each polishing pad was 63, the slurry was accumulated on the polishing pads in the glass substrate removing step (S334), and the concentration of the slurry at that time was 15 wt%. No cleaning step was performed after the end of the polishing step (S333) and before the glass substrate removing step (S334). With respect to Working Example 4, the evaluation result of the defect inspection was "B", and the evaluation result of the read/write test was "B".

[0086] (Working Example 5)

For the glass substrates of Working Example 5, the attraction force was 13.0 g/cm², the number of communication holes in each polishing pad was 88, the slurry was accumulated on the polishing pads in the glass substrate removing step (S334), and the concentration of the slurry at that time was 15 wt%. No cleaning step was performed after the end of the polishing step (S333) and before the glass substrate removing step (S334). With respect to Working Example 5, the evaluation result of the defect inspection was "A", and the evaluation result of the read/write test was "A".

[0087] (Comparative Example 1)

For the glass substrates of Comparative Example 1, the attraction force was 17.5 g/cm², the number of communication holes in each polishing pad was 24, and the slurry was not accumulated on the polishing pads in the glass substrate removing step (S334). A cleaning step was performed after the end