

CORRECTION FLUID

TECHNICAL FIELD

[0001] The present invention relates to a correction fluid that can be applied to cover
5 errors in text etc., so that the errors are masked and new characters can be rewritten thereon.

BACKGROUND

[0002] Conventionally, titanium oxide, which is known to have high masking properties,
has been widely used as a means of covering and masking errors for correction. Titanium
10 oxide easily settles due to its high specific gravity, and over time the settled titanium oxide
becomes a hard settled layer called hard cake, which cannot be redispersed simply by shaking
the container. Therefore, correction fluids and marker inks using titanium oxide are used by
placing a metal or glass agitator in the container and shaking the container before use to
redisperse the settled titanium oxide.

15 Patent Document 1 discloses a correction fluid using such titanium oxide as a masking
material and anhydrous silica obtained by a dry process to improve the redispersibility.

Further, Patent Document 2 discloses a white ink that can also be used as a correction
fluid, using needle-like particles to improve the redispersibility.

20 Citation List

Patent Literature

[0003]

Patent Document 1: JP2001-152097A

Patent Document 2: JP2012-131927A

25

SUMMARY

[0004] The correction fluid and the white ink disclosed in Patent Documents 1 and 2 may
improve the redispersibility of titanium oxide. However, it was found that users of the

commercial products did not have a good impression of redispersibility, and detailed research by the inventors revealed a problem caused by the way of use of the correction fluid.

Normally, when using a correction fluid, an agitator such as a metal rod contained in a container together with the correction fluid is moved by shaking the container to agitate the correction fluid in the container before application. In such cases, the application after agitation and the standing during non-use are alternated, and the state of non-use standing is often prolonged due to the fact that the correction fluid is only used in situations of error. When this application after agitation and prolonged re-standing are repeated, sufficient dispersion of titanium oxide is gradually lost even if the container is shaken several times during use, so that only a thin liquid or viscous material is discharged, and a non-uniform coating film is formed, resulting in insufficient masking properties against errors in text, etc. This phenomenon is thought to be caused by the fact that the settled layer gradually turns into hard cake due to insufficient agitation at each use or accumulation of insufficient agitation. The conventional correction fluids, including Patent Documents 1 and 2, only evaluated the redispersibility of the correction fluid after one long period of time, and did not focus on the problem of repeated use.

[0005] An object of the present invention is to provide a correction fluid that can form a good coating film even after repeated agitation, application, and prolonged standing.

[0006] (1) A correction fluid according to at least one embodiment of the present invention comprises at least: a titanium oxide; a hydrocarbon solvent; a particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more; and one or a mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite.

(2) In some embodiments, in the correction fluid described in the above (1), the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more has a hydroxyl group on a surface of the particle.

(3) In some embodiments, in the correction fluid described in the above (1) or (2), the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is one or a mixture of two or more selected from the group consisting of calcium carbonate, titanium oxide, and silicon nitride.

(4) In some embodiments, in the correction fluid described in any one of the above (1) to (3), a weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite is 5 or more and 1500 or less.

(5) In some embodiments, in the correction fluid described in any one of the above (1) to (4), the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is calcium carbonate, and a difference in specific gravity between the particle and dry silica is 0.7 or less.

[0007] Dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite are known as materials that form loose aggregates in a hydrocarbon solvent, which are linked with branched chains and partially aggregate and disperse in response to external force. The presence of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more in such loose aggregates is assumed to make the structure of aggregates of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite non-uniform and form a composite structure with coarse and dense portions as a whole. The particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more significantly differs in shape from the other particles and is sufficiently coarse relative to the substances such as dry silica. This suppresses the formation of a dense, solid aggregate structure, and also exerts a function that

increases the influence of external force on the aggregated state by the agitation effect, forming a composite aggregate structure that is easy to flow, preventing titanium oxide from densely agglomerating to form hard cake, and forming aggregates that are loose and easy to agitate while the composite aggregate structure dominantly keeps the dispersed state of titanium oxide for a long period of time. Thus, even if the agitation, application, and re-standing are repeated, the hard caking is prevented without any compaction by the agitator, a thin liquid or viscous material is not discharged, and a uniform coating film is formed to reliably mask errors in text.

Further, when the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more has a hydroxyl group on the surface, the particle can form a hydrogen bond with dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, which further suppresses the hard caking of titanium oxide.

Further, when the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is one or a mixture of two or more selected from the group consisting of calcium carbonate, titanium oxide, and silicon nitride, the agitation effect on the composite, loose aggregate structure with dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite can be easily and efficiently exerted.

Additionally, in the correction fluid, when the weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite is 5 or more and 1500 or less, the particle efficiently exists in the aggregates of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite while keeping the dispersed state of titanium oxide to form a composite aggregate structure that is looser and easier to agitate, as well as the efficiency of the agitation effect is improved.

Further, when the particle having a major axis of 1.6 μm or more and 170 μm or less, a

minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is calcium carbonate, and a difference in specific gravity between the particle and dry silica is 0.7 or less, it is possible to prevent separation of the particle and dry silica from the composite aggregate structure due to the difference in sedimentation rate, so that the composite aggregate structure is easily maintained, and the effect of loose aggregation and the agitation effect can be efficiently exerted.

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIG. 1 is a longitudinal cross-sectional view of the entire application tool.

10 FIG. 2 is an enlarged view of part I of FIG. 1.

FIG. 3 is a perspective view of the application tool in use.

DETAILED DESCRIPTION

[0009] Titanium oxide used in the correction fluid of the present invention is a white pigment having high masking properties, and may have been subjected to surface treatment with alumina or silica. Illustrative examples of titanium oxide include TITONE SR-1, R-650, R-62N, R-42, R-7E, R-21, R-25, R-32, R-5N, R-45M, and TCR-10 (manufacture by Sakai Chemical Industry Co., Ltd.), KRONOS KR-310, KR-380, and 480 (manufactured by Titan Kogyo, Ltd.), TI-PURE R-900, R-902, R-960, and R-931 (manufactured by DuPont Japan, Ltd.), TITANIX JR-301, JR-805, JR-806, JR-603, JR-800, JR-403, JR-701, JRNC, and JR-605 (manufactured by TAYCA Co., Ltd.), and TIPAQUE R-820, R-830, R-550, R-780, and R-780-2 (manufactured by Ishihara Sangyo Co., Ltd.). These titanium oxides may be used alone or as a mixture of two or more. The adding amount is preferably 20 wt% or more and 60 wt% or less based on the total amount of the correction fluid, in terms of masking properties.

[0010] The hydrocarbon solvent is used to adjust the viscosity of the correction fluid. Illustrative examples thereof include aliphatic hydrocarbon solvents such as n-pentane (boiling point 36.0°C), cyclopentane (boiling point 49.2°C), methylcyclopentane (boiling

point 71.8°C), n-hexane (boiling point 68.7°C), 2-methylpentane (boiling point 60.2°C), 3-methylpentane (boiling point 63.2°C), 2,2-dimethylbutane (boiling point 49.7°C), 2,3-dimethylbutane (boiling point 58.0°C), n-heptane (boiling point 98.4°C), 2-methylhexane (boiling point 90.0°C), 3-methylhexane (boiling point 91.8°C), 2,2-dimethylhexane (boiling point 79.2°C), 2,3-dimethylpentane (boiling point 89.7°C), 2,4-dimethylpentane (boiling point 80.5°C), 3,3-dimethylpentane (boiling point 86.0°C), 3-ethylpentane (boiling point 93.4°C), 2,2,3-trimethylbutane (boiling point 80.0°C), n-octane (boiling point 125.6°C), 4-methylheptane (boiling point 117.7°C), 2-methylheptane (boiling point 117.6°C), 3-methylheptane (boiling point 118.9°C), 2,2-dimethylhexane (boiling point 108.8°C), 2,3-dimethylhexane (boiling point 115.6°C), 2,4-dimethylhexane (boiling point 109.4°C), 2,5-dimethylhexane (boiling point 109.1°C), 3,3-dimethylhexane (boiling point 111.9°C), 3,4-dimethylhexane (boiling point 117.7°C), 3-ethylhexane (boiling point 118.5°C), 2,2,3-trimethylpentane (boiling point 109.8°C), 2,2,4-trimethylpentane (boiling point 99.2°C), 2,3,3-trimethylpentane (boiling point 114.7°C), 2,3,4-trimethylpentane (boiling point 113.4°C), 2-methyl-3-ethylpentane (boiling point 115.6°C), 3-methyl-3-ethylpentane (boiling point 118.2°C), cyclohexane (boiling point 80.0°C), methylcyclohexane (boiling point 100.9°C), ethylcyclohexane (boiling point 132°C). Illustrative examples that are commercially available include MARUKASOL FH (cyclopentane, manufactured by Maruzen Petrochemical Co., Ltd.), methylcyclohexane (manufactured by Sankyo Chemical Co., Ltd.), and Exxsol DSP100/140 (cyclic aliphatic hydrocarbon solvent, initial distillation point 102°C, dry point 138°C) (manufactured by ExxonMobil Co., U.S.). 2-methylpentane, 3-methylpentane, 2,2-dimethylbutane, and 2,3-dimethylbutane are collectively referred to as isohexane, and commercially available examples include high-purity isohexane (manufactured by Sankyo Chemical Co., Ltd.). 2-methylhexane, 3-methylhexane, 2,2-dimethylhexane, 2,3-dimethylpentane, 2,4-dimethylpentane, 3,3-dimethylpentane, 3-ethylpentane, and 2,2,3-trimethylbutane are collectively referred to as isoheptane, and commercially available examples include isoheptane (manufactured by Tokyo Chemical Industry Co., Ltd.). 4-methylheptane, 2-methylheptane, 3-methylheptane, 2,2-dimethylhexane, 2,3-dimethylhexane,

2,4-dimethylhexane, 2,5-dimethylhexane, 3,3-dimethylhexane, 3,4-dimethylhexane, 3-ethylhexane, 2,2,3-trimethylpentane, 2,2,4-trimethylpentane, 2,3,3-trimethylpentane, 2,3,4-trimethylpentane, 2-methyl-3-ethylpentane, and 3-methyl-3-ethylpentane are collectively referred to as isooctane, and commercially available examples include MARUKASOL 8
5 (manufactured by Maruzen Petrochemical Co., Ltd.) and isooctane (Sankyo Chemical Co., Ltd.). These hydrocarbon solvents preferably have a boiling point of 40 to 150°C in terms of drying properties of the coating film. These hydrocarbon solvents can be used alone or as a mixture. The use amount thereof is preferably 30 to 60 wt% based on the total amount of the correction fluid in terms of good application properties.

10 [0011] By combining the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more with one or a mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, it is possible to provide a correction fluid that can form a good coating film even after repeated agitation,
15 application, and prolonged standing.

Examples of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more include silicon nitride whisker, silicon carbide whisker, aluminum borate whisker, zinc oxide whisker, potassium titanate whisker, calcium carbonate whisker, titanium oxide
20 whisker, alumina whisker, magnesia whisker, mullite whisker, magnesium borate whisker, titanium boride whisker, alumina and alumina silica short fibers, silica short fibers, zirconia fibers (short fibers), and kaolin ceramic short fiber, silica short fiber, zirconia fiber (short fiber), and kaolin-based ceramic short fiber. Illustrative examples that are commercially available include FTL-100 (major axis 1.68 μm, minor axis 0.13 μm, aspect ratio 12.9,
25 specific gravity 4.2, titanium oxide with hydroxyl groups on the surface), FTL-200 (major axis 2.86 μm, minor axis 0.21 μm, aspect ratio 13.6, specific gravity 4.2, titanium oxide with hydroxyl groups on the surface), FTL-300 (major axis 5.15 μm, minor axis 0.27 μm, aspect ratio 19.1, specific gravity 4.2, titanium oxide with hydroxyl groups on the surface)

(manufactured by Ishihara Sangyo Co., Ltd.), Whiscal A (major axis 20 μm , minor axis 1 μm , aspect ratio 20.0, specific gravity 2.86, calcium carbonate with hydroxyl groups on the surface, manufactured by Maruo Calcium Co., Ltd.), Silar (major axis 40 μm , minor axis 0.55 μm , aspect ratio 72.7, specific gravity 3.2, silicon carbide with hydroxyl groups on the surface, manufactured by Haydale Technologies Inc., U.K.), and silicon nitride whisker (major axis 170 μm , minor axis 1.3 μm , aspect ratio 130.7, specific gravity 3.18, silicon nitride with hydroxyl groups on the surface, manufactured by Tateho Chemical Industries Co., Ltd.). The major axis and aspect ratio of the particle can be adjusted by crushing particles using a planetary ball mill. The use amount of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is preferably 5 wt % or more and 15 wt% or less based on the total amount of the correction fluid. In this case, the particle exists to the extent that it can exert the agitation effect in the correction fluid, and it is easy to form a composite aggregate structure where the particle can easily flow in agglomerates of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, so that the formation of good coating film can be maintained even after repeated agitation, application, and prolonged standing, and the correction fluid can be dispensed stably. The particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more preferably has a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more and 131 less. Such a particle is excellent in flowability, rigid, difficult to break, and maintains a good agitation effect. Further, the particle having a major axis of 5 μm or more and 40 μm or less, a minor axis of 0.2 μm or more and 1 μm or less, and an aspect ratio (major axis/minor axis) of 8 or more and 73 or less is more preferable since it is more excellent in flowability, rigid, difficult to break, and further maintains a good agitation effect. The particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is sufficiently coarse in particle size when the primary particles

of the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, which form aggregates around the particle, have an average particle size of 7 nm to 30 nm. This allows the particle to efficiently exert a function that increases the influence of external force on the aggregated state by the agitation effect.

[0012] When the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more has a hydroxyl group on the surface, the particle can form a hydrogen bond with dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite. As a result, the composite structure with coarse and dense portions is easily maintained as a whole by the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more and the aggregates of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, the aggregate structure that is loose and easy to agitate is maintained, a thin liquid or viscous material is not discharged even after repeated agitation, application, and prolonged standing, and a uniform coating film is formed to reliably mask errors in text.

[0013] Dry silica is produced by combustion hydrolysis of silicon tetrachloride in the gas phase (dry process), and differs in structure and properties from wet silica such as white carbon and silica gel, which are produced by the reaction of sodium silicate with acid (wet process). Since the primary particles of dry silica have no internal surface area, dry silica has low bulk density (bulk density: 30 to 60 g/L) and small primary particle size (average primary particle size: 7 to 40 nm). Wet silica has very large internal surface area, relatively high bulk density (130 to 400 g/L), and large primary particle size (average primary particle size: 150 to 7000 nm). Further, due to hydrogen bonds between silanol groups on the surface of silica particles, dry silica forms loose aggregates in a hydrocarbon solvent, which are linked with branched chains and partially agglomerate and disperse in response to external forces.

Illustrative examples of dry silica include AEROSIL 130 (average primary particle size

16 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL 200 (average primary particle size 12 nm, bulk density 50 g/L, specific gravity 2.2) AEROSIL 300 (particle size 7 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL 380 (average primary particle size 7 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL R972 (hydrophobic fumed silica with hydrophobic surface covered with methyl groups, average primary particle size 16 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL 50 (average primary particle size 30 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL RX200 (hydrophobic fumed silica with hydrophobic surface covered with methyl groups, average primary particle size 12 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL R976-S (hydrophobic fumed silica with hydrophobic surface covered with methyl groups, average primary particle size 7 nm, bulk density 50 g/L, specific gravity 2.2), AEROSIL R972CF (hydrophobic fumed silica with hydrophobic surface covered with methyl groups, particle size 16 nm, bulk density 30 g/L, specific gravity 2.2), and AEROSIL TT600 (particle size 40 nm, bulk density 60 g/L, specific gravity 2.2) (manufactured by Nippon Aerosil Co., Ltd.). The use amount of dry silica may be 0.01 to 1 wt% based on the total amount of the correction fluid in order to make the correction fluid easy to dispense and form a thin coating film with good drying properties. The hydrophobic fumed silica with hydrophobic surface covered with methyl groups is preferable because it is easily wetted by a hydrocarbon solvent and forms stable aggregated particles.

[0014] Fatty acid amide is organic amide wax composed of fatty acid and amine. Illustrative examples thereof include A670-20M, A671-EZ, 6820-20M, 6820-10M, and FS-6010 (manufactured by Kusumoto Chemicals Ltd.). When the use amount of fatty acid amide is 0.01 to 1.5 wt% based on the total amount of the correction fluid, the correction fluid can be easily dispensed, a thin film can be formed, the coating film dries easily, and a good correction fluid can be obtained.

[0015] Modified urea is a substance having a structure in which urea groups and low-polarity groups are long-linked. Illustrative examples thereof include BYK-410, BYK-411, and BYK 7411 ES (manufactured by BYK-Chemie, Germany). When the use amount of

modified urea is 0.01 to 1 wt% based on the total amount of the correction fluid, the correction fluid can be easily dispensed, a thin film can be formed, the coating film dries easily, and a good correction fluid can be obtained.

[0016] Oxidized polyethylene is wax made by oxidizing polyethylene and introducing polar groups. Illustrative examples thereof include PF-920, PF-911, PF-930, and 4401-25M (manufactured by Kusumoto Chemicals Ltd.). When the use amount of oxidized polyethylene is 0.01 to 1 wt% based on the total amount of the correction fluid, the correction fluid can be easily dispensed, a thin film can be formed, the coating film dries easily, and a good correction fluid can be obtained.

[0017] Bentonite is preferably an organic bentonite that has been organically modified with a quaternary ammonium cation or the like because it is easily wetted by a hydrocarbon solvent and forms stable aggregated particles. Illustrative examples of organic bentonite include S-BEN N-400, S-BEN W, S-BEN NX, S-BEN NX80, S-BEN NZ, S-BEN NZ70 (manufactured by HOJUN Co., Ltd.), CLAYTONE-AF, CLAYTONE-APA, and CLAYTONE-HY (manufactured by BYK-Chemie, Germany). When the use amount of bentonite is 0.01 to 1 wt% based on the total amount of the correction fluid, the correction fluid can be easily dispensed, a thin film can be formed, the coating film dries easily, and a good correction fluid can be obtained.

[0018] The weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite in the correction fluid is preferably 5 or more and 1500 or less. In this case, the particle efficiently exists in aggregates of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite while keeping the dispersed state of titanium oxide to form a composite aggregate structure that is looser and easier to agitate, as well as the efficiency of the agitation effect is improved. The weight ratio is a value calculated by dividing the weight of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis

of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more in the correction fluid by the weight of the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite in the correction fluid.

5 [0019] The ratio of volume occupancy of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to dry silica in the correction fluid is preferably 3.8 or more and 1153.8 or less. In this case, silanol groups on the surface of dry silica form hydrogen bonds with the particle having a major axis of 1.6 μm or more and 170 μm or less, a
10 minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more, so that the composite structure is formed with high reproducibility, where the aggregates are looser and easier to agitate while keeping the dispersed state of titanium oxide. Additionally, the efficiency of the agitation effect is improved.

The ratio of volume occupancy in the present invention is determined by the following
15 expression 1.

Expression 1: Ratio of volume occupancy of compound A to compound B = (mass of compound A in correction fluid / specific gravity of compound A) / (mass of compound B in correction fluid / specific gravity of compound B)

[0020] Preferably, the particle having a major axis of 1.6 μm or more and 170 μm or less,
20 a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is calcium carbonate, and the difference in specific gravity between the particle and dry silica is 0.7 or less. In this case, the loose and easily agitated aggregated state is maintained, and the separation of the particle and dry silica from the composite structure is prevented, and the effect of loose aggregation and the agitation effect can be efficiently
25 exerted.

[0021] In addition to these essential components, other substances may be added for various purposes.

Resin soluble in a hydrocarbon solvent may be used to disperse a pigment and fix the

correction fluid to a paper surface, etc. As the resin soluble in a hydrocarbon solvent, maleic acid resin, alkyd resin, thermoplastic elastomer, petroleum resin, terpene resin, terpene phenolic resin, or rosin-based resin may be used. In consideration of pigment dispersibility and fixation on paper surface, acrylic resin is preferable. As the acrylic resin, copolymers of various monomers may be used. Examples of usable monomers include acrylic acid esters such as methyl acrylate, ethyl acrylate, isopropyl acrylate, n-butyl acrylate, 2-ethylhexyl acrylate, methacrylate esters such as methyl methacrylate, ethyl methacrylate, propyl methacrylate, isopropyl methacrylate, and n-butyl methacrylate, isobutyl methacrylate, tert-butyl methacrylate, 2-ethylhexyl methacrylate, octyl methacrylate, lauryl methacrylate, cetyl methacrylate, stearyl methacrylate, oleyl methacrylate, cyclohexyl methacrylate, benzyl methacrylate, monomers containing an amino group such as N,N-dimethylaminopropyl (meth)acrylate, N,N-diethylaminopropyl (meth)acrylate, N,N-dibutylaminoethyl (meth)acrylate, N,N-dipropylaminoethyl (meth)acrylate, N,N-diisopropylaminoethyl (meth)acrylate, N,N-di-tert-butylaminoethyl (meth)acrylate, N,N-dicyclohexylaminoethyl (meth)acrylate, N,N-dimethylaminoethyl (meth)acrylamide, N,N-diethylaminoethyl (meth)acrylamide, N,N-dimethylaminopropyl (meth)acrylamide, N,N-diethylaminopropyl (meth)acrylamide, and vinyl monomers such as vinyl acetate, styrene, vinyl toluene, maleic acid, itaconic acid, 2-hydroxyethyl methacrylate, hydroxypropyl methacrylate, 2-hydroxypropyl acrylate, hydroxypropyl acrylate, acrylamide, N-methyl acrylamide, diacetone acrylamide, glycidyl methacrylate. The use amount of resin soluble in a hydrocarbon solvent is preferably 3 to 15 wt% of the total amount of the correction fluid in terms of the resin solid content, which provides sufficient fixation to allow rewriting.

[0022] In addition, white, black, or colored pigment may be used to match the color tone of the correction fluid, or expander pigment and resin particles may be used to improve the masking properties. Illustrative examples include spherical or lumpy particles such as fine carbon dioxide titanium oxide, crosslinked polymethyl methacrylate, benzoguanamine-formaldehyde condensation, benzoguanamine-melamine-formaldehyde condensation, melamine-formaldehyde condensation, wet silica, aluminum silicate, and calcium carbonate,

and plate-like particles such as mica, talc, boron nitride, and molybdenum disulfide. Examples of aluminum silicate include KYOWAAD 700 (aluminum silicate, Kyowa Chemical Industry Co., Ltd.). As the colored pigment, yellow iron oxide and substoichiometric titanium oxide are preferable because they have less difference in specific gravity than titanium dioxide, so the difference in sedimentation rate is less and the color tone is less likely to change. The yellow iron oxide is a yellow pigment. Preferable examples of commercially available yellow iron oxide include TAROX LL-XLO, LL-100, LEMON, HY-100, HY-200, HY-250 (manufactured by Titan Kogyo, Ltd.), Bayferrox 415, 420, 1420, 3420, 1420M, 910, 920, 930, 940, 943, 960, 3905, 3910, 3920, 3950, 920Z, 1920 (manufactured by Bayer Co., Ltd.), and YP-200N, YP-100N, YP-50N (manufactured by Tone Sangyo Co., Ltd.), etc. These yellow iron oxides can be used alone or as a mixture of two or more. The use amount thereof is preferably 0.01 to 5 wt% based on the total amount of the correction fluid. The substoichiometric titanium oxide is a black pigment. Examples of commercially available substoichiometric titanium oxide include Black conductive titanium oxide M-1, and S-1 (manufactured by Ishihara Sangyo Co., Ltd.), and Tilack D (manufactured by Ako Kasei Co., Ltd.). These substoichiometric titanium oxides can be used alone or as a mixture of two or more. The use amount thereof is preferably 0.01 to 0 wt% based on the total amount of the correction fluid. Other pigments can also be used, including PV Fast Yellow H2G (C.I. pigment yellow 120), PV Fast Yellow H3R-LHC (C.I. pigment yellow 181), PV Fast Blue BG (C.I. pigment blue 15:3) (manufactured by Clariant Chemicals Ltd.), T-18N Signal Green (green fluorescent pigment, DayGlo Color Corp., U.S.), and Chromofine Red 6820 (C.I. pigment violet 19, manufactured by Dainichiseika Color & Chemicals Mfg. Co., Ltd.).

[0023] To stabilize the dispersion of titanium dioxide and pigments, anionic surfactants such as alkyl sulfates, alkyl phosphates, and polycarboxylic acid polymers, nonionic surfactants such as polyethylene alkyl ethers, glycerin fatty acid esters, and polyoxyethylene fatty acid esters, and dispersants such as quaternary ammonium salts and alkyl amine salts may be added.

[0024] The correction fluid of the present invention can be obtained by dispersing and

mixing the above-described components using an agitating disperser such as a ball mill, an attritor, a sand grinder, or an impeller.

[0025] An example of an application tool in which the correction fluid of the present invention is preferably used will be described based on the attached drawings. However, the dimensions, materials, shapes, and relative arrangements are not limited thereto. The correction fluid of the present invention can also be filled and used in other application tools, such as brush-type dipping brush applicators, ballpoint pen tip type applicators, and pressurized applicators with a correction fluid tank charged with compressed air, etc.

[0026] As shown in FIG. 1 and FIG. 2, which is an enlarged view of part I of FIG. 1, the application tool includes a bottomed cylindrical rear shaft 2 composed of a flexible polyamide resin blow-molded product for containing a correction fluid 1, a machined stainless steel tip 3 with a discharge port 3a for discharging the correction fluid 1 to the outside, a front shaft 4 composed of a polybutylene terephthalate resin injection-molded product interposed between and connecting the rear shaft 2 and the tip 3, and an application body 6 composed of a self-lubricating polyacetal resin injection-molded product.

As shown in FIG. 3, which is a perspective view of the application tool in use, a coating film 5 of the dispensed correction fluid can be effectively applied by the application body 6 to form a smooth coating film.

[0027] The rear shaft 2 is flexible and can be deformed. For dispensing the correction fluid 1, the inside of the rear shaft 2 is compressed and pressurized by pressing, for example, grasping tightly with the hand to supply the correction fluid 1 to the open discharge port 3a. Of course, the means of compressing and pressurizing the inside of the rear shaft 2 is not limited to this example, but can be set appropriately according to the specifications of the application tool, such as a pump pressurization mechanism in which the rear end is knocked to pressurize the inside of the rear shaft 2. Further, the material is not limited to polyamide resin as in this example, but may be any material that does not react with the correction fluid 1 and has flexibility so that the shape can be deformed, such as polyacetal resin, polybutylene terephthalate resin, polybutylene naphthalate resin, or fluororesin. The rear shaft 2 houses

an agitation body 7 made of carbon steel capable of agitating the correction fluid 1 for example by shaking the container. In this example, a single rod-shaped carbon steel is placed as the agitation body 7, but the material, shape, and number of agitation bodies 7 can be set appropriately according to the composition of the correction fluid 1 and the size and shape of the rear shaft 2. In particular, the agitation body having a relatively high specific gravity and non-reactive to the correction fluid 1 contained inside the rear shaft 2 can efficiently agitate the correction fluid.

[0028] The front shaft 4 is interposed between the rear shaft 2 and the tip 3 and has a through hole through which the rear shaft 2 and the tip 3 are communicated to dispense the correction fluid 1 contained in the rear shaft 2 through the discharge port 3a of the tip 3. In this example, the front shaft 4 and the rear shaft 2 are joined by screwing to enable filling of the correction fluid 1 during manufacturing and replenishment of the correction fluid 1 after use. However, if the front shaft 4 has a through hole, the means of joining the rear shaft 2 and the tip 3 is not limited to screwing or press-fitting depending on the method of filling the correction fluid 1 during manufacturing. The rear shaft 2 may be joined by press fitting, or the rear shaft 2 and/or the tip 3 may be melted or glued together, as long as the volatilization or outflow of solvent of the correction fluid 1 through the joint portion can be suppressed by sealing. The material of the front shaft 4 is not limited to the polybutylene terephthalate resin injection-molded product as shown in this example, but may be made of any material that does not react with the correction fluid 1 and can connect the rear shaft 2 and the tip 3. For example, it may be made of synthetic resin such as polyamide resin, polyacetal resin, polybutylene naphthalate resin, fluororesin, metal, or glass, etc. Although not shown in the figure, a cap is placed on the front shaft 4 to cover the tip 3 and the application body 6 to prevent the opening of the discharge port 3a of the tip 3 from being disturbed by the dried correction fluid 1 when not in use. Further, since the front shaft 4 is member with a through hole to connect the rear shaft 2 and the tip 3, if the rear shaft 2 can be joined with the tip 3 and the application body 6 and the cap can be removably placed to cover the tip 3 and application body 6 and block the outside air, the front shaft 4 does not necessarily need to be placed.

The cap does not necessarily have to be used. The dried correction fluid formed when not in use may be destroyed when in use to open the discharge port 3a of the tip 3 and allow the correction fluid to be dispensed.

[0029] The inside of the tip 3 is a so-called valve mechanism: when not in use, a coil spring 8 placed as an elastic member to prevent the correction fluid 1 from leaking out through the discharge port 3a biases a core 9 against a closure portion 3b to close the discharge port 3a, and the pressure contact with the closure portion 3b is released when the core 9 retracts. A tip end portion 9a of the core 9 protrudes from a tip end portion 6b of a protruding portion 6a of the application body 6 so as to retract upon contact with a surface to be applied during use to release the pressure contact with the coil spring 8, which is an elastic member, and open the discharge port 3a. The size of the discharge port 3a, which opens when the core 9 is pressed into contact with the surface, is set to be a desirable value to allow the coating film 5 to be formed more effectively and smoothly when the correction fluid 1 is dispensed, but it can be set appropriately according to the shape and size of the application body 6 and the specifications of the dispense amount. In this example, the stainless steel coil spring 8, the machined stainless steel tip 3 and core 9 are used. However, the parts are not limited to the materials and machined products of this example as long as they do not interfere with the reactivity of the correction fluid 1, the sealing performance, or the opening and closing of the discharge port 3a. Each or some of the parts may be an injection-molded product made of polyacetal resin, polybutylene terephthalate resin, polyamide resin, polybutylene naphthalate resin, or fluoro resin.

[0030] The application body 6 has two protruding portions 6a at positions facing each other and parallel to each other from a base portion 6c, which is on the same line in the radial direction as the discharge port 3a of the tip 3. As a result, when the core 9 contacts the surface to be applied and the discharge port 3a opens, the correction fluid 1 spreads to the area surrounded by the protruding portions 6a, the base portion 6c of the application body 6, and the surface to be applied. As shown in the perspective view of the application tool in use in FIG. 3, by applying the correction fluid 1 with the correction fluid 1 spread over the area

surrounded by the protruding portions 6a, the base portion 6c of the application body 6, and the surface, the coating film 5 of the correction fluid 1 is formed very evenly, and the coating film 5 of the correction fluid 1 can be formed more effectively and smoothly. The application body 6 in this example is composed of a self-lubricating polyacetal resin injection-molded product, and the contact portion of the protruding portion 6a with a surface to be applied is curved to reduce scratching and frictional resistance with the contact surface and facilitate smooth application. However, the material may be synthetic resin such as polybutylene terephthalate resin, polyamide resin, polybutylene naphthalate resin, fluororesin, or metal, glass, etc., as long as it does not react with the correction fluid. Further, the protruding portion 6a may be a separate part from the application body 6, and the shape of the protruding portion 6a is not limited to a curved surface, and the material and shape can be set appropriately according to the specifications of the application tool.

Examples

[0031] Hereinafter, the present invention will be described in detail with reference to examples.

[0032] (Preparation of correction fluid)

Tables 1 to 10 show correction fluids of Examples 1 to 41 and Comparative Examples 1 to 10 and results of various tests described later.

The correction fluids of Examples and Comparative Examples were obtained by dispersing components except for particles 1 to 14 using a planetary ball mill (Planetary Ball Mill Quartet P-5, manufactured by Fritsch, Germany) with 2-mm diameter beads at 250 rpm for 30 minutes, adding particles 1 to 14 corresponding to the table, and stirring the mixture with a three-one motor for 1 hour. For the formulations, the following were used specifically.

[0033] <Titanium oxide>

Titanium oxide-1: TITONE R-7E (titanium oxide, manufactured by Sakai Chemical Industry Co., Ltd.)

Titanium oxide-2: TITONE R-62N (titanium oxide, manufactured by Sakai Chemical

Industry Co., Ltd.)

Titanium oxide-3: TITANIX JR-800 (titanium oxide, manufactured by TAYCA Co., Ltd.)

5 Titanium oxide-4: TITANIX JR-805 (titanium oxide, manufactured by TAYCA Co., Ltd.)

Titanium oxide-5: TIPAQUE R-780 (titanium oxide, manufactured by Ishihara Sangyo Co., Ltd.)

Titanium oxide-6: TIPAQUE R-780-2 (titanium oxide, manufactured by Ishihara Sangyo Co., Ltd.)

10 Titanium oxide-7: TITONE R-5N (titanium oxide, manufactured by Sakai Chemical Industry Co., Ltd.)

Titanium oxide-8: KRONOS KR-380 (titanium oxide, manufactured by Titan Kogyo, Ltd.)

[0034] <Resin soluble in hydrocarbon solvent>

15 Resin-1: Dianal BR-105 (acrylic resin, manufactured by Mitsubishi Chemical Corporation)

Resin-2: Dianal BR-115 (acrylic resin, manufactured by Mitsubishi Chemical Corporation)

20 Resin-3: Dianal BR-11122 (acrylic resin, manufactured by Mitsubishi Chemical Corporation)

Resin-4: Acryloid B-67 (acrylic resin, manufactured by Rohm and Haas Company, U.S.)

[0035] <Hydrocarbon solvent>

Solvent-1: High purity isohexane (manufactured by Sankyo Chemical Co., Ltd.)

25 Solvent-2: MARUKASOL FH (cyclopentane, manufactured by Maruzen Petrochemical Co., Ltd.)

Solvent-3: methylcyclohexane (manufactured by Sankyo Chemical Co., Ltd.)

[0036] <Surfactant>

Surfactant-1: ANTIGEL 6217 (surfactant, manufactured by Bernd Dchwegmann Gmbh

- & Co., KG, Germany)
- Surfactant-2: DISPER BYK-102 (surfactant, manufactured by BYK-Chemie, Germany)
- Surfactant-3: SCHWEGO wett 6292 (surfactant, manufactured by Bernd Dchwegmann Gmbh & Co., KG, Germany)
- 5 Surfactant-4: DISPER BYK-108 (surfactant, manufactured by BYK-Chemie, Germany)
- Surfactant-5: DISPARLON PW-36 (surfactant, manufactured by Kusumoto Chemicals Ltd.)
- Surfactant-6: HOMOGENOL-18 (surfactant, manufactured by Kao Corporation)
- Surfactant-7: PROFAN (surfactant, manufactured by Sanyo Chemical Industries, Ltd.)
- 10 [0037] <Dry silica, fatty acid amide, modified urea, oxidized polyethylene, bentonite>
- Dry silica-1: AEROSIL R972 (hydrophobic dry silica, manufactured by Nippon Aerosil Co., Ltd.)
- Dry silica-2: AEROSIL 200 (dry silica, manufactured by Nippon Aerosil Co., Ltd.)
- Dry silica-3: AEROSIL RX200 (hydrophobic dry silica, manufactured by Nippon
- 15 Aerosil Co., Ltd.)
- Dry silica-4: AEROSIL 50 (dry silica, manufactured by Nippon Aerosil Co., Ltd.)
- Dry silica-5: AEROSIL 380 (dry silica, manufactured by Nippon Aerosil Co., Ltd.)
- Dry silica-6: AEROSIL R976-S (hydrophobic dry silica, manufactured by Nippon Aerosil Co., Ltd.)
- 20 Fatty acid AM-1: DISPARLON 6820-20M (fatty acid amide, active ingredient 20%, manufactured by Kusumoto Chemicals Ltd.)
- Modified urea-1: BYK-411 (modified urea, active ingredient 27%, manufactured by BYK-Chemie, Germany)
- Oxidized PE-1: PF-920 (oxidized polyethylene, active ingredient 20%, manufactured by
- 25 Kusumoto Chemicals Ltd.)
- Bentonite-1: S-BEN N-400 (organic bentonite, manufactured by HOJUN Co., Ltd.)
- [0038] <Particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or

more>

Particle-1: Whiskal A (calcium carbonate, major axis 20 μm , minor axis 1 μm , aspect ratio 20.0, specific gravity 2.86, manufactured by Maruo Calcium Co., Ltd.)

Particle-2: FTL-300 (titanium oxide, major axis 5.15 μm , minor axis 0.27 μm , aspect ratio 19.1, specific gravity 4.2, manufactured by Ishihara Sangyo Co., Ltd.)

Particle-3: Silar (silicon carbide, major axis 40 μm , minor axis 0.55 μm , aspect ratio 72.7, specific gravity 3.2, manufactured by Haydale Technologies Inc., U.K.)

Particle-4: FTL-100 (major axis 1.68 μm , minor axis 0.13 μm , aspect ratio 12.9, specific gravity 4.2, manufactured by Ishihara Sangyo Co., Ltd.)

Particle-5: FTL-200 (major axis 2.86 μm , minor axis 0.21 μm , aspect ratio 13.6, specific gravity 4.2, manufactured by Ishihara Sangyo Co., Ltd.)

Particle-6: Silicon nitride whisker (major axis 170 μm , minor axis 1.3 μm , aspect ratio 130.7, specific gravity 3.18, manufactured by Tateho Chemical Industries Co., Ltd.)

Particles-7: particle obtained by crushing Whiskal A using a planetary ball mill (Planetary Ball Mill Quartet P-5, manufactured by Fritsch, Germany) with 10-mm diameter beads at 150 rpm for 5 minutes. (calcium carbonate, major axis 10 μm , minor axis 1 μm , aspect ratio 10.0, specific gravity 2.86)

Particles-8: particle obtained by crushing Whiskal A using a planetary ball mill (Planetary Ball Mill Quartet P-5, manufactured by Fritsch, Germany) with 10-mm diameter beads at 200 rpm for 5 minutes. (calcium carbonate, major axis 8 μm , minor axis 1 μm , aspect ratio 8.0, specific gravity 2.86)

Particles-9: particle obtained by crushing Whiskal A using a planetary ball mill (Planetary Ball Mill Quartet P-5, manufactured by Fritsch, Germany) with 10-mm diameter beads at 250 rpm for 5 minutes. (calcium carbonate, major axis 5 μm , minor axis 1 μm , aspect ratio 5.0, specific gravity 2.86)

[0039] <Particle not having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more>

Particle-10: PANGEL-B5 (hydrous magnesium silicate, major axis 1.7 μm, minor axis 0.02 μm, aspect ratio 85.0, manufactured by TORSAL, Spain)

Particle-11: NYAD-G (calcium silicate, major axis 825 μm, minor axis 55 μm, aspect ratio 15.0, manufactured by IMERYS, U.S.)

5 Particle-12: NYAD 1250 (calcium silicate, major axis 12 μm, minor axis 4 μm, aspect ratio 3.0, manufactured by IMERYS, U.S.)

Particle-13: Super S (heavy calcium carbonate, major axis 4 μm, minor axis 4 μm, aspect ratio 1.0, manufactured by Maruo Calcium Co., Ltd.)

10 Particle-14: PC (light calcium carbonate, major axis 1.2 μm, minor axis 0.48 μm, aspect ratio 2.5, manufactured by Shiraishi Kogyo Kaisha, Ltd.)

The major axis and minor axis in the present invention were determined from the following expression by measuring Feret diameter (distance between parallel lines when the image of a particle is sandwiched between two parallel lines) of 200 randomly selected particles, with the maximum value (maximum Feret diameter) as the major axis (L) and the
15 minimum value (minimum Feret diameter) as the minor axis (D), according to the method of JIS Z 8827-1:2008.

$$\text{Major axis} = \Sigma(L_i^2) / \Sigma L_i$$

$$\text{Minor axis} = \Sigma(D_i^2) / \Sigma D_i$$

Aspect ratio = $L/D = [\Sigma(L_i^2) / \Sigma L_i] / [\Sigma(D_i^2) / \Sigma D_i]$ (The major axis (particle size) of
20 each particle is L1, L2, ..., L200, and the minor axis is D1, D2, ..., D200, respectively.

[0040] <Pigment>

Black pigment-1: Tilack D (substoichiometric titanium oxide, black pigment, manufactured by Ako Kasei Co., Ltd.)

25 Yellow pigment-1: TAROX LL-100 (yellow iron oxide, manufactured by Titan Kogyo, Ltd.)

Yellow pigment-2: PV Fast Yellow H2G (C.I. pigment yellow 120, manufactured by Clariant Chemicals Ltd.)

Green pigment-1: T-18N Signal Green (green fluorescent pigment, manufactured by

DayGlo Color Corp., U.S.)

Blue pigment-1: PV Fast Blue BG (C.I. pigment blue 15:3, manufactured by Clariant Chemicals Ltd.)

5 Red pigment-1: Chromofine Red 6820 (C.I. pigment violet 19, manufactured by Dainichiseika Color & Chemicals Mfg. Co., Ltd.)

Orange pigment-1: PV Fast Yellow H3R-LHC (C.I. pigment yellow 181, manufactured by Clariant Chemicals Ltd.)

Extender pigment-1: KYOWAAD 700 (aluminum silicate, Kyowa Chemical Industry Co., Ltd.)

10 [0041] Plasticizer-1: MAR-N (methyl acetyl ricinoleate, manufactured by Daihachi Chemical Industry Co., Ltd.)

Wet silica-1: P-603 (wet silica, manufactured by Mizusawa Industrial Chemicals, Ltd.)

Wet silica-2: P-801 (wet silica, manufactured by Mizusawa Industrial Chemicals, Ltd.)

Amino acid-1: GP-1 (dibutyl lauroyl glutamide, Ajinomoto Co., Ltd.)

15 [0042] The “weight ratio” described in the table means the weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite, specifically, the ratio of content of the
20 particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more when the content of the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite is 1.

[0043] The “ratio of volume occupancy” described in the table means the ratio of volume
25 occupancy of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to dry silica in the correction fluid.

[0044] The “difference in specific gravity” described in the table means the difference in

specific gravity between the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more and calcium carbonate particle.

[0045] In order to evaluate the correction fluids of Examples and Comparative Examples, the application tool shown in FIG. 1 was prepared and filled with 7 mL of any of the correction fluids of Examples 1 to 41 and Comparative Examples 1 to 10, which was used as the test application tool.

[0046] Visibility masking properties: A straight line was drawn using the test application tool between white and black portions on a masking rate measurement paper (in accordance with JIS K 5600), and the masking properties of the coating film were evaluated visually. If the color of the coating on the white portion is perceived to be different from that on the black portion, the coating is evaluated as having no visibility masking properties. The notation of the visibility masking property test results in the table for each condition and the explanation of the conditions are described below.

Initial visibility masking property: A straight line was drawn between white and black portions of the masking rate measurement paper to form a coating film with the test application tool filled with the correction fluid immediately after blending, and the visibility masking property of the coating film was evaluated visually.

First visibility masking property: The test application tool that has been evaluated for initial visibility masking property was capped and left for 6 months at room temperature with the discharge port facing upward. Then, the test application tool was shaken 5 times and the cap was removed. A straight line was drawn between white and black portions of the masking rate measurement paper to form a coating film, and the visibility masking property of the coating film was evaluated visually.

Second visibility masking property: The test application tool that has been evaluated for first visibility masking property was capped and left for 6 months at room temperature again with the discharge port facing upward. Then, the test application tool was shaken 5 times and the cap was removed. A straight line was drawn between white and black portions of

the masking rate measurement paper to form a coating film, and the visibility masking property of the coating film was evaluated visually.

Third visibility masking property: The test application tool that has been evaluated for second visibility masking property was capped and left for 6 months at room temperature again with the discharge port facing upward. Then, the test application tool was shaken 5 times and the cap was removed. A straight line was drawn between white and black portions of the masking rate measurement paper to form a coating film, and the visibility masking property of the coating film was evaluated visually.

Criteria of visibility masking properties

O: The color of the coating on the white portion is not perceived to be different from that on the black portion.

X: The color of the coating on the white portion is perceived to be different from that on the black portion.

[0047] (Masking rate test)

The correction fluid obtained from each of Examples and Comparative Examples was applied with a 50- μ m applicator to a masking rate measurement paper (JIS K 5600, with white and black portions printed adjacent to each other and coated with varnish, which can be easily applied but not penetrated by paint diluted with solvent or water). After drying, the Y-values of the coating film on the white portion and the coating film on the black portion of the masking rate measurement paper were measured with a color computer (SE6000, manufactured by Nippon Denshoku Industries, Co., Ltd.), and the ratio (Y-value of the coating film on the black portion / Y-value of the coating film on the white portion) was calculated as a percentage to determine the masking rate. The closer the masking rate is to 100%, the better the masking property is; less than 90% is insufficient masking property, and the color under the coating film shows through. The notation of the masking rate test results in the table for each condition and the explanation of the conditions are described below.

Initial masking rate (%): The masking rate was measured by the above-described masking rate test immediately after preparing the correction fluid.

First masking rate (%): The test application tool was capped and left for 6 months at room temperature with the discharge port facing upward. Then, the test application tool was shaken 5 times, the front shaft was removed, and the correction fluid was taken out to measure the masking rate by the masking rate test.

5 Second masking rate (%): Immediately after taking out the correction fluid for measuring the first masking rate (%), the front shaft was returned, and the test application tool left for 6 months at room temperature again with the discharge port facing upward. Then, the test application tool was shaken 5 times, the front shaft was removed, and the correction fluid was taken out to measure the masking rate by the masking rate test.

10 Third masking rate (%): Immediately after taking out the correction fluid for measuring the second masking rate (%), the front shaft was returned, and the test application tool left for 6 months at room temperature again with the discharge port facing upward. Then, the test application tool was shaken 5 times, the front shaft was removed, and the correction fluid was taken out to measure the masking rate by the masking rate test.

15 Rate of change in masking rate: The rate of change between the initial masking rate (%) and the third masking rate (%) (third masking rate / initial masking rate) was calculated.

[0048] (Deformation load test)

The correction fluid obtained in each of Examples and Comparative Examples was placed in a screw-top bottle S-5 (glass container, Nichiden Rika Glass Co., Ltd., 70 mm depth, 17 mm inner diameter, 12 mL capacity) to a height of 50 mm, and the load was measured when an adapter with an outer diameter of 10 mm and a thickness of 1 mm was pushed into the correction fluid at a speed of 2 cm/min with FUDOH rheometer RTC-3010D (rheometer, manufactured by Rheotech Co., Ltd.). The maximum load value up to the point where the adapter reaches a depth of 49 mm from the liquid surface of the correction fluid was used as the deformation load, and it was used as an index of the ease of deformation (flowability) against external force. When the adapter reaches the bottom of the bottle, the rheometer does not detect the load pushing the adapter into the correction fluid, and the value measured by the rheometer is maximized. For this reason, the detection was made from the time the

adapter entered the correction fluid until 49 mm just before it reached the bottom of the bottle. The smaller the deformation load value, the smaller the load required to push the adapter at a constant speed in the correction fluid, and the easier it is to deform in response to external force and the easier it is to achieve a gentle and efficient agitation effect. The notation of the deformation load test results in the table for each condition and the explanation of the conditions are described below.

First deformation load (g): The screw-top bottle S-5 containing the prepared correction fluid was sealed with a lid and left at room temperature for 6 months. Then, the lid was removed and the deformation load test was performed.

Second deformation load (g): Immediately after the first deformation load was measured, the correction fluid was stirred with a spatula for 10 seconds, sealed with a lid, and left at room temperature for 6 months. Then, the lid was removed and the deformation load test was performed.

Third deformation load (g): Immediately after the second deformation load was measured, the correction fluid was stirred with a spatula for 10 seconds, sealed with a lid, and left at room temperature for 6 months. Then, the lid was removed and the deformation load test was performed.

[0049] (Table 1)

	Example 1	Example 2	Example 3	Example 4	Example 5
Titanium oxide -1	18.00	30.00			
Titanium oxide -2	18.00	5.00	11.00		29.00
Titanium oxide -3			24.00		
Titanium oxide -5				27.00	
Titanium oxide -7				13.00	
Resin -1		7.00			
Resin -2	7.00		7.00		
Resin -3				7.00	6.90
Solvent -1		18.10	22.00		
Solvent -2	18.00	27.635	24.50	46.65	20.00
Solvent -3	27.90				27.75
Surfactant -1	1.00	0.50			
Surfactant -2			1.00		
Surfactant -3		1.50			
Surfactant -4				1.00	
Surfactant -5					1.00

Dry silica -1	0.10	0.25	0.50		
Dry silica -2				0.25	0.25
Modified urea -1					0.10
Bentonite -1				0.10	
Particle -1	10.00	10.00		5.00	15.00
Particle -7			10.00		
Black pigment -1		0.015			
Weight ratio	100.0	40.0	20.0	14.3	54.2
Difference in specific gravity	0.66	0.66	0.66	0.66	0.66
ratio of volume occupancy	76.9	30.8	15.4	15.4	46.2
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	95.4	95.6	95.4	95.1	95.3
First visibility masking property	O	O	O	O	O
First masking rate (%)	95.3	95.5	95.3	95.0	95.1
First deformation load (g)	3	2	4	4	4
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	95.2	95.5	95.2	94.8	94.9
Second deformation load (g)	4	2	4	5	6
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	95.2	95.4	95.2	94.6	94.7
Third deformation load (g)	4	3	4	6	6
rate of change in masking rate	0.998	0.998	0.998	0.995	0.994

[0050] (Table 2)

	Example 6	Example 7	Example 8	Example 9	Example 10
Titanium oxide -1		40.00			
Titanium oxide -2					35.00
Titanium oxide -4				28.80	
Titanium oxide -7			29.00		
Titanium oxide -8	40.94				
Resin -1		7.20			
Resin -2			6.90		7.00
Resin -3				6.90	
Resin -4	7.56				
Solvent -1			24.00	18.99	18.90
Solvent -2	38.40		24.08	28.80	

Solvent -3		45.285			25.60
Surfactant -1		1.50			
Surfactant -2				1.50	
Surfactant -3			1.00		
Surfactant -5					1.50
Surfactant -6	0.76				
Plasticizer -1	3.27				
Dry silica -1	0.26				
Dry silica -4		1.00			2.00
Dry silica -5			0.02	0.01	
Particle -1	7.30	5.00	15.00	15.00	
Particle -8					10.00
Black pigment -1	0.50	0.015			
Yellow pigment -1	1.01				
Weight ratio	28.1	5.0	750.0	1500.0	5.0
Difference in specific gravity	0.66	0.66	0.66	0.66	0.66
ratio of volume occupancy	21.6	3.8	576.9	1153.8	3.8
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	95.4	95.3	95.1	95.3	95.3
First visibility masking property	O	O	O	O	O
First masking rate (%)	95.3	95.2	95.0	95.2	95.2
First deformation load (g)	3	5	5	4	4
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	95.3	94.9	94.8	94.9	94.7
Second deformation load (g)	4	5	6	5	5
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	95.2	94.8	94.5	94.8	94.6
Third deformation load (g)	4	6	6	6	6
Rate of change in masking rate	0.998	0.995	0.994	0.995	0.993

[0051] (Table 3)

	Example 11	Example 12	Example 13	Example 14	Example 15
Titanium oxide -1	22.00			25.00	
Titanium oxide -2			9.00	16.00	37.30
Titanium oxide -3		34.20			
Titanium oxide -5			27.00		

Titanium oxide -7	14.00				
Resin -1	7.00				7.20
Resin -2		7.10		7.20	
Resin -3			7.10		
Solvent -1	17.99	19.50		18.80	23.00
Solvent -2		28.13	45.88		24.00
Solvent -3	27.50			15.175	
Surfactant -1			1.00		1.00
Surfactant -3				1.00	
Surfactant -4	1.50				
Surfactant -5		1.00			
Dry silica -1	0.01				
Dry silica -2					2.50
Dry silica -3		0.05			
Dry silica -5				0.01	
Dry silica -6			0.015		
Fatty acid AM -1		0.01			
Oxidized PE -1			0.01		
Particle -1	10.00	10.00	10.00		
Particle -2					5.00
Particle -3				16.80	
Black pigment -1		0.015		0.015	
Weight ratio	1000.0	192.3	5000.0	1680.0	2.0
Difference in specific gravity	0.66	0.66	0.66		
ratio of volume occupancy	769.2	153.8	512.8	1155.0	1.0
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	95.4	95.3	95.3	93.0	93.6
First visibility masking property	O	O	O	O	O
First masking rate (%)	95.3	95.2	95.2	92.8	93.5
First deformation load (g)	3	4	3	10	7
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	95.3	95.1	95.2	91.4	91.2
Second deformation load (g)	3	4	4	12	10
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	95.2	95.1	95.1	91	90.5
Third deformation load (g)	4	4	4	14	12
Rate of change in masking rate	0.998	0.998	0.998	0.968	0.967

[0052] (Table 4)

	Example 16	Example 17	Example 18	Example 19	Example 20
Titanium oxide -2		45.45	45.67	45.22	45.45
Titanium oxide -4	37.50				
Resin -1		14.05	14.12	13.98	14.05
Resin -2	7.20				
Solvent -2	22.50				
Solvent -3	23.50	34.46	35.25	33.88	33.06
Surfactant -1		1.26	1.26	1.25	1.26
Surfactant -5	1.00				
Surfactant -7		0.45	0.46	0.45	0.45
Plasticizer -1		0.64	0.64	0.64	0.64
Dry silica -2		0.70			
Dry silica -4	3.30				
Fatty acid AM-1			1.10		
Modified urea -1				1.60	
Oxidized PE-1					2.10
Particle -1					
Particle -2	5.00	2.00			
Particle -3				1.50	
Particle -4					2.00
Particle -9			1.00		
Yellow pigment -2		0.99			
Green pigment -1				1.48	
Blue pigment-1			0.50		
Red pigment -1					0.99
Weight ratio	1.5	2.9	4.5	3.5	4.8
Difference in specific gravity					
ratio of volume occupancy	0.8	1.5			
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	93.5	93.2	93.7	93.1	93.5
First visibility masking property	O	O	O	O	O
First masking rate (%)	93.4	93.1	93.6	93.0	93.4
First deformation load (g)	7	8	8	7	10
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	91.5	91.4	92.0	91.5	91.0
Second deformation load (g)	9	13	12	11	12
Third visibility masking property	O	O	O	O	O

Third masking rate (%)	90.4	90.1	90.9	90.1	90
Third deformation load (g)	12	14	14	14	15
Rate of change in masking rate	0.967	0.967	0.970	0.968	0.963

[0053] (Table 5)

	Example 21	Example 22	Example 23	Example 24	Example 25
Titanium oxide -1				25.00	
Titanium oxide -2	45.45	40.00		16.00	22.00
Titanium oxide -7			24.00		
Resin -1	14.05				6.80
Resin -2				7.20	
Resin -3		7.20	6.80		
Solvent -1		17.70	21.60	18.80	
Solvent -2		23.55	26.55		25.00
Solvent -3	32.26			27.475	29.68
Surfactant -1	1.26				
Surfactant -2		1.00			1.50
Surfactant -3				1.00	
Surfactant -4			1.00		
Surfactant -7	0.45				
Plasticizer -1	0.64				
Fatty acid AM-1		5.55	0.05		
Modified urea -1				0.01	0.02
Bentonite -1	0.90				
Particle -3	4.00				
Particle -5		5.00	20.00		15.00
Particle -6				4.50	
Black pigment -1				0.015	
Orange pigment -1	0.99				
Weight ratio	4.4	4.5	2000.0	1666.7	2777.8
Difference in specific gravity					
ratio of volume occupancy					
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	93.4	93.0	93.4	93.5	93.0
First visibility masking property	O	O	O	O	O
First masking rate (%)	93.3	92.8	93.2	93.3	92.8
First deformation load (g)	7	9	8	10	9
Second visibility masking property	O	O	O	O	O

Second masking rate (%)	91.6	91.4	91.5	91.6	91.6
Second deformation load (g)	10	13	10	11	10
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	90.3	90.1	90.3	90	90.1
Third deformation load (g)	13	14	12	15	13
Rate of change in masking rate	0.967	0.969	0.967	0.963	0.969

[0054] (Table 6)

	Example 26	Example 27	Example 28	Example 29	Example 30
Titanium oxide -2	13.00			22	
Titanium oxide -3	26.00				
Titanium oxide -4		22.00			
Titanium oxide -6					30
Titanium oxide -7			39.00		6
Resin -1		6.80			7.1
Resin -2	7.20		7.20		
Resin -3				6.8	
Solvent -1		21.80		20.7	
Solvent -2	40.80	27.845			
Solvent -3			45.8	28.992	44.635
Surfactant -1				1.50	
Surfactant -2					1.00
Surfactant -3	1.50				
Surfactant -4			1.50		
Surfactant -5		1.50			
Fatty acid AM-1					1.25
Oxidized PE-1	6.50	0.055			
Bentonite -1			1.50	0.008	
Particle -1					10.00
Particle -2	5.00	20.00			
Particle -3			5.00	20.00	
Black pigment -1					0.015
Weight ratio	3.8	1818.2	3.3	2500.0	40.0
Difference in specific gravity					
ratio of volume occupancy					
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	93.5	93.6	93.7	93.0	94.7
First visibility masking	O	O	O	O	O

property					
First masking rate (%)	93.3	93.4	93.5	92.8	94.5
First deformation load (g)	10	9	8	10	6
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	91.0	91.5	91.6	91.4	94.2
Second deformation load (g)	13	10	12	12	7
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	90.2	90.4	90.4	90.1	93.9
Third deformation load (g)	14	14	13	14	7
Rate of change in masking rate	0.965	0.966	0.965	0.969	0.992

[0055] (Table 7)

	Example 31	Example 32	Example 33	Example 34	Example 35
Titanium oxide -1			23.00	35.20	
Titanium oxide -2			12.00		
Titanium oxide -3					35.50
Titanium oxide -5	36.00				
Titanium oxide -6		33.70			
Resin -1					7.00
Resin -2		7.10		7.00	
Resin -3	7.10		7.00		
Solvent -1	16.80		20.80		
Solvent -2	26.60	20.10	25.51	45.93	
Solvent -3		22.10			44.15
Surfactant -1			1.50		
Surfactant -2					1.50
Surfactant -3		1.00		1.50	
Surfactant -4	1.00				
Fatty acid AM-1	2.50	6.00			
Modified urea -1			0.19	0.37	1.85
Particle -1	10.00	10.00	10.00	10.00	10.00
Weight ratio	20.0	8.3	194.9	100.1	20.0
Difference in specific gravity					
ratio of volume occupancy					
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	93.8	94.5	93.9	94.2	95.2
First visibility masking	O	O	O	O	O

property					
First masking rate (%)	93.6	94.3	93.7	94.0	95.0
First deformation load (g)	6	5	6	6	6
Second visibility masking property	O	O	O	O	O
Second masking rate (%)	93.5	94.2	93.5	93.8	94.7
Second deformation load (g)	7	6	6	7	6
Third visibility masking property	O	O	O	O	O
Third masking rate (%)	93	93.6	93	93.4	93.9
Third deformation load (g)	7	7	7	7	7
Rate of change in masking rate	0.991	0.990	0.990	0.992	0.986

[0056] (Table 8)

	Example 36	Example 37	Example 38	Example 39	Example 40	Example 41
Titanium oxide -1			22.00			
Titanium oxide -2	17.00	15.00				
Titanium oxide -3				35.20		
Titanium oxide -5	18.00					34.50
Titanium oxide -6		20.00			34.80	
Titanium oxide -7			13.00			
Resin -1	7.00					7.00
Resin -2		7.00			7.00	
Resin -3			7.00	7.00		
Solvent -1	21.50	18.40	16.60	16.80	19.80	20.70
Solvent -2	24.50	26.85			27.15	25.80
Solvent -3			25.40	29.90		
Surfactant -1						1.00
Surfactant -2			1.00			
Surfactant -3				1.00		
Surfactant -4		1.50			1.00	
Surfactant -5	1.50					
Oxidized PE-1	0.50	1.25	5.00			
Bentonite -1				0.10	0.25	1.00
Particle -1	10.00	10.00	10.00	10.00	10.00	10.00
Weight ratio	100.0	40.0	10.0	100.0	40.0	10.0
Difference in specific gravity						
ratio of volume occupancy						
Initial visibility masking property	O	O	O	O	O	O

Initial masking rate (%)	94.8	94.8	95.0	94.1	93.7	94.5
First visibility masking property	O	O	O	O	O	O
First masking rate (%)	94.6	94.6	94.8	93.9	93.5	94.3
First deformation load (g)	7	7	6	7	6	6
Second visibility masking property	O	O	O	O	O	O
Second masking rate (%)	94.5	94.5	94.6	93.6	93.5	94.3
Second deformation load (g)	7	7	7	7	7	6
Third visibility masking property	O	O	O	O	O	O
Third masking rate (%)	94	93.8	93.9	93.2	92.9	93.8
Third deformation load (g)	7	7	7	7	7	7
Rate of change in masking rate	0.992	0.989	0.988	0.990	0.991	0.993

[0057] (Table 9)

	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Comparative Example 5
Titanium oxide -1	19.00				18.00
Titanium oxide -2	16.00		45.45		18.00
Titanium oxide -3				23.00	
Titanium oxide -4				22.00	
Titanium oxide -5		18.00			
Titanium oxide -7		17.00			
Resin -1	7.00	7.00	14.05		
Resin -2				7.20	7.00
Solvent -1	21.50			22.70	
Solvent -2	25.50	45.50			18.00
Solvent -3			33.77	23.85	27.90
Surfactant -1			1.26		1.00
Surfactant -2	1.00				
Surfactant -3		1.50			
Surfactant -4				1.00	
Surfactant -7			0.45		
Plasticizer -1			0.64		
Dry silica -1				0.25	0.10
Particle -1	10.00	10.00			
Particle -10					10.00
Red pigment -1			0.99		
Extender pigment-1			3.40		
Wet silica-1		1.00			
Weight ratio					

Difference in specific gravity					
ratio of volume occupancy					
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	92.5	92.3	92.1	92.2	92.4
First visibility masking property	O	O	O	O	O
First masking rate (%)	92.3	92.1	90.0	90.2	90.0
First deformation load (g)	3	3	15	13	14
Second visibility masking property	X	X	X	X	X
Second masking rate (%)	75.8	74.8	60.5	65.4	68.3
Second deformation load (g)	20	25	40	30	40
Third visibility masking property	X	X	X	X	X
Third masking rate (%)	69.8	68.3	40.1	45.7	50.2
Third deformation load (g)	30	40	65	50	45
Rate of change in masking rate	0.755	0.740	0.425	0.496	0.543

[0058] (Table 10)

	Comparative Example 6	Comparative Example 7	Comparative Example 8	Comparative Example 9	Comparative Example 10
Titanium oxide -1	30.00			18.00	40.00
Titanium oxide -2	5.00	11.00		18.00	
Titanium oxide -3		24.00			
Titanium oxide -6			40.00		
Resin -1	7.00				12.00
Resin -2		7.00		7.00	
Resin -3			6.80		
Solvent -1	18.30	22.00			
Solvent -2	27.94	24.50		18.00	
Solvent -3			36.45	27.90	42.70
Surfactant -1			1.50	1.00	
Surfactant -2		1.00			
Surfactant -3	1.50				
Dry silica -1	0.25	0.50	0.25	0.10	
Dry silica -6					0.30
Particle -11	10.00				
Particle -12		10.00			
Particle -13			15.00		
Particle -14				10.00	

Black pigment -1	0.01				
Wet silica -2					2.00
Amino acid -1					3.00
Weight ratio					
Difference in specific gravity					
ratio of volume occupancy					
Initial visibility masking property	O	O	O	O	O
Initial masking rate (%)	92.3	92.1	92.2	92.1	92.0
First visibility masking property	O	O	O	O	O
First masking rate (%)	90.3	90.4	90.0	90.3	90.2
First deformation load (g)	12	15	15	12	13
Second visibility masking property	X	X	X	X	X
Second masking rate (%)	67.4	66.7	62.2	65.3	61.1
Second deformation load (g)	30	40	30	40	30
Third visibility masking property	X	X	X	X	X
Third masking rate (%)	46.3	43.5	40.5	42.5	40.2
Third deformation load (g)	48	55	64	61	65
Rate of change in masking rate	0.502	0.472	0.439	0.461	0.437

[0059] In the correction fluids of Examples 1 to 41, since the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more has a hydroxyl group on the surface and is one or a mixture of two or more selected from the group consisting of calcium carbonate, titanium oxide, and silicon nitride, the correction fluid was dispensed well, and a smooth coating film with high masking properties was obtained even after repeated agitation, application, and prolonged standing. Particularly, in the correction fluids of Examples 1 to 13 and 30 to 41, since the weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and

bentonite is 5 or more and 1500 or less, the change rate of the masking rate was almost 1, the first deformation load and the third deformation load are almost constant, and a good coating film with particularly high masking properties was obtained even after repeated agitation, application, and prolonged standing.

5 Further, in the correction fluids of Examples 1 to 13, since the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is calcium carbonate, and the difference in specific gravity between the particle and dry silica is 0.7 or less, a good coating film with particularly high masking properties was obtained even after repeated agitation,
10 application, and prolonged standing.

Further, in the correction fluids of Examples 1 to 13, since the ratio of volume occupancy of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more to dry silica is 3.8 or more and 1153.8 or less, a good coating film with particularly high
15 masking properties was obtained even after repeated agitation, application, and prolonged standing.

[0060] In contrast, when the corrective fluids of Comparative Examples 1 to 10 were evaluated for visibility masking properties after repeated agitation, application and prolonged standing, only a thin liquid was discharged, resulting in a coating film with no visibility
20 masking properties. In the correction fluids of Comparative Examples 1 to 10, the third masking rate was also much lower than 90%, and the black part of the masking rate test paper under the coating film showed through and was not masked, resulting in an unfavorable coating film.

25

CLAIMS

1. A correction fluid, comprising at least:
a titanium oxide;
5 a hydrocarbon solvent;
a particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more; and
one or a mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite.
10
2. The correction fluid according to claim 1,
wherein the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more has a hydroxyl group on a surface of the particle.
15
3. The correction fluid according to claim 1 or 2,
wherein the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is one or a mixture of two or more selected from the group consisting of calcium
20 carbonate, titanium oxide, and silicon nitride.
4. The correction fluid according to any one of claims 1 to 3,
wherein a weight ratio of the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major
25 axis/minor axis) of 5 or more to the one or the mixture of two more selected from the group consisting of dry silica, fatty acid amide, modified urea, oxidized polyethylene, and bentonite is 5 or more and 1500 or less.

5. The correction fluid according to any one of claims 1 to 4,

wherein the particle having a major axis of 1.6 μm or more and 170 μm or less, a minor axis of 0.1 μm or more and 1.3 μm or less, and an aspect ratio (major axis/minor axis) of 5 or more is calcium carbonate, and a difference in specific gravity between the particle and dry silica is 0.7 or less.