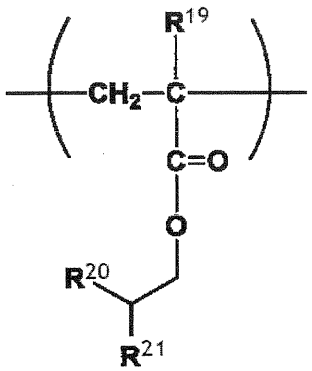
groups whose carbon number is 1 to 4, alicyclic hydrocarbon groups whose carbon number is 3 to 6, aromatic hydrocarbon groups whose carbon number is 6 to 10, halogen atoms, ester groups, acyl groups and a nitro group.)

[0014] (4) The coloring material dispersion liquid according to (1), (2) or (3), wherein the acryl copolymer further has a structure represented by a formula (F) below which has in the side chain a carboxylic acid ester.

[Chem. 7]



(F)

(In the formula, R^{19} represents a hydrogen atom or a methyl group, R^{20} represents a hydrogen atom or an alkyl group whose carbon atom number 1 to 20, and R^{21} represents an alkyl group whose carbon atom number 2 to 40.)

[0015] (5) The coloring material dispersion liquid according to (4), wherein a total carbon number of the R^{20} and the R^{21} is greater than or equal to 4.

[0016] (6) The coloring material dispersion liquid according to any one of (3) to (5), having a structure represented by a formula (E2).

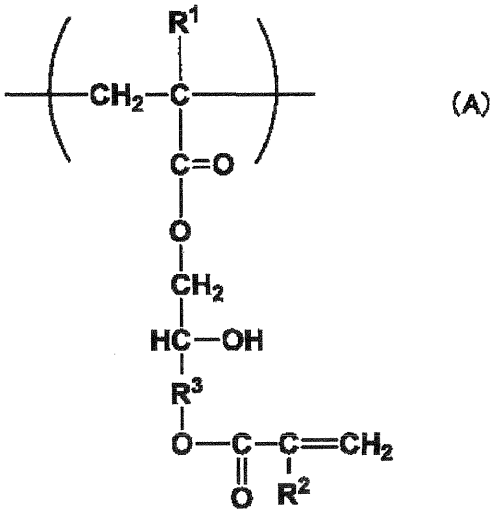
[0017] (7) The coloring material dispersion liquid according to any one of (1) to (6), containing, in addition to the acryl copolymer, a high-molecular dispersing agent that has at least a tertiary amino group.

[0018] (8) A photosensitive coloring resin composition containing at least the coloring material dispersion liquid according to any one of (1) to (7), a multifunctional acryl monomer and a photo-radical polymerization initiating agent.

[0018a] In one aspect, there is provided a coloring material dispersion liquid containing at least a coloring material, an acryl copolymer and an organic solvent, the

coloring material dispersion liquid being characterized in that the acryl copolymer has at least a structure represented by a formula (A) below which has in a side chain an ethylenic unsaturated group, a structure represented by a formula (B) below which has in a side chain a tertiary amino group and/or a structure represented by a formula (C) below which has in a side chain a quaternary ammonium salt, a structure (D) having in a side chain a carboxyl group, and a structure (E) having an aromatic ring, and that, as for the acryl copolymer, a base value is 10 to 30 mmol/100 g, an acid value is 50 to 120 mgKOH/g, and a weight-average molecular weight in terms of polystyrene by gel permeation chromatography is 5,000 to 30,000.

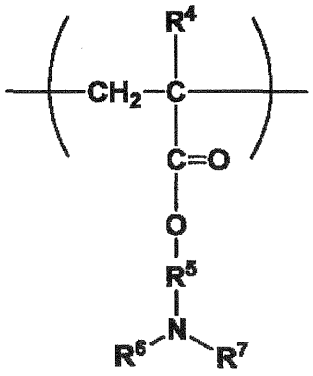
[Chem. 1]



(A)

(In the formula, R^1 and R^2, independently of each other, represent a hydrogen atom or a methyl group, and R^3 represents a species selected from alkylene groups whose carbon number is 1 to 4, divalent alicyclic hydrocarbon groups whose carbon number is 3 to 6 and divalent aromatic hydrocarbon groups whose carbon number is 6 to 10.)

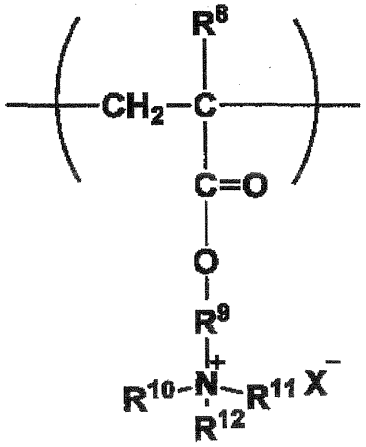
[Chem. 2]



(B)

(In the formula, R^4 represents a hydrogen atom or a methyl group, R^5 represents a species selected from alkylene groups whose carbon number is 1 to 4, divalent alkoxy groups whose carbon number is 1 to 4, divalent alicyclic hydrocarbon groups whose carbon number is 3 to 6 and divalent aromatic hydrocarbon groups whose carbon number is 6 to 10, and R^6 and R^7, independently of each other, represent a species selected from alkyl groups whose carbon number is 1 to 4, alkoxy groups whose carbon number is 1 to 4, alicyclic hydrocarbon groups whose carbon number is 3 to 6 and aromatic hydrocarbon groups whose carbon number is 6 to 10.)

[Chem. 3]



(C)

(In the formula, R^8 represents a hydrogen atom or a methyl group, R^9 represents a species selected from alkylene groups whose carbon number is 1 to 4, divalent alkoxy groups whose carbon number is 1 to 4, divalent alicyclic hydrocarbon groups whose carbon number is 3 to 6 and divalent aromatic hydrocarbon groups whose carbon number is 6 to 10, R^{10}, R^{11} and R^{12}, independently of each other, represent a species selected from alkyl groups whose carbon number is 1 to 4, alkoxy groups whose carbon number is 1 to 4, alicyclic hydrocarbon groups whose carbon number is 3 to 6 and aromatic hydrocarbon groups whose carbon number is 6 to 10, and X represents any one of bromine, chlorine, iodine, hydrogen sulfate and hydroxide.)

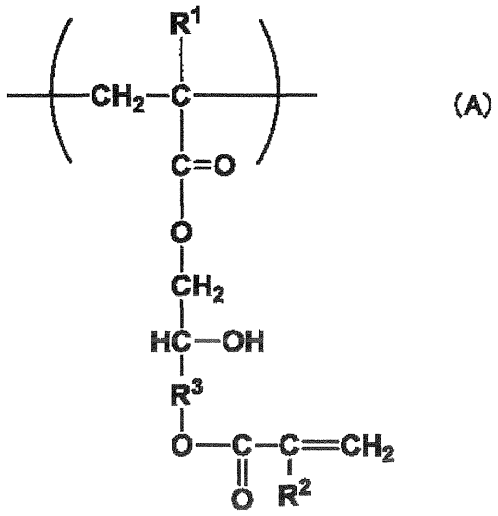
Effect of the invention

[0019] The coloring material dispersion liquid of the invention attains characteristics

Claims

[Claim 1]A coloring material dispersion liquid containing at least a coloring material, an acryl copolymer and an organic solvent, the coloring material dispersion liquid being characterized in that the acryl copolymer has at least a structure represented by a formula (A) below which has in a side chain an ethylenic unsaturated group, a structure represented by a formula (B) below which has in a side chain a tertiary amino group and/or a structure represented by a formula (C) below which has in a side chain a quaternary ammonium salt, a structure (D) having in a side chain a carboxyl group, and a structure (E) having an aromatic ring, and that, as for the acryl copolymer, a base value is ~~5 to 70 mmol/100 g~~10 to 30 mmol/100 g, an acid value is 50 to 120 mgKOH/g, and a weight-average molecular weight in terms of polystyrene by gel permeation chromatography is 5,000 to 30,000.

[Chem. 1]



(A)

(In the formula, R^1 and R^2, independently of each other, represent a hydrogen atom or a methyl group, and R^3 represents a species selected from alkylene groups whose carbon number is 1 to 4, divalent alicyclic hydrocarbon groups whose carbon number is 3 to 6 and divalent aromatic hydrocarbon groups whose carbon number is 6 to 10.)