containing silane compounds, ketimine-containing silane compounds and isocyanate-containing silane compounds is added (Patent Document 2) and wherein a silane coupling agent having an ureido group is added (Patent Document 3). However, in cases where soda glass is used as the substrate, a sufficient adhesion is not obtained, and there are problems in that the black matrix is peeled by a treatment under a high temperature and high humidity, or by a treatment with a chemical such as aqua regia or an amine-containing peeling liquid. On the other hand, a silane coupling agent having an imido group has been proposed for a hard coating agent in order to promote adhesion (Patent Document 4, Patent Document 5), the adhesion to the soda glass for touch panels was insufficient.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0008]

Patent Document 1: JP 2008-260927 A

Patent Document 2: JP 2006-330209 A

Patent Document 3: JP 2010-102086 A

Patent Document 4: WO 2008/065944

Patent Document 5: WO 2009/096050

SUMMARY ~~OF THE INVENTION~~

PROBLEMS TO BE SOLVED ~~BY THE INVENTION~~

[0009]

In view of the above-described drawbacks of the prior art, an object of the embodiments of the present ~~invention~~disclosure is to provide a colored resin composition with which a black matrix having a high adhesion with a substrate surface constituted by a metal or an inorganic material, and having a high chemical resistance can be readily formed. Through the use of such a colored resin composition, a resin black matrix and a substrate for touch panel having excellent reliability can be obtained.

MEANS FOR SOLVING THE PROBLEMS

[0010]

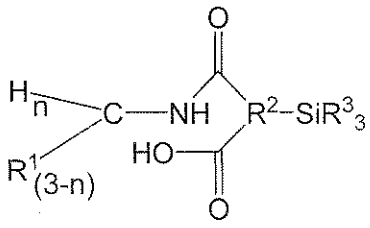
To solve the problems of the prior art, the present inventors have intensively studied to discover that the problem to be solved by the present ~~invention~~disclosure can be solved by using, as an adhesion promoter, a silane coupling agent having a specific structure.

[0011]

Thus, the object of the embodiments of the present ~~invention~~disclosure is achieved by the following constitution in a first aspect:

~~(1)~~ A colored resin composition comprising at least (A) a color pigment; (B) an alkali-soluble resin, (C) an adhesion promoter and (D) an organic solvent, the composition comprising as the (C) adhesion promoter at least a silane coupling agent represented by the Formula (1) below:

[0012]



(1)

[0013]

(wherein R^1 may be the same or different from each other and represents a C_1-C_6 alkyl group which optionally has a substituent(s); n represents 0 or 1; R^2 represents a C_3-C_{30} trivalent organic group; R^3 may be the same or different from each other and represents a C_1-C_6 alkyl group, a C_1-C_6 alkoxy group, a phenyl group, a hydroxyl group or a phenoxy group wherein each of the groups other than the hydroxyl group optionally has a substituent(s)).

~~(2)~~ In an embodiment, ~~The colored resin composition according to (1), wherein~~ the (C) adhesion promoter is a silane coupling agent represented by the Formula (1) wherein n = 0.

~~(3)~~ In some embodiments, the composition~~The colored resin composition according to (1) or (2), which~~ comprises at least two silane coupling agents as the (C) adhesion promoter.

~~(4)~~ In some embodiments,~~The colored resin composition according to any one of (1) to (3), wherein~~ the (A) color pigment is a black light-shielding material.

~~(5)~~ In some embodiments, the composition~~The colored resin composition according to any one of (1) to (4), which~~ comprises at least titanium nitride compound particles and/or carbon black as the black light-shielding material.

~~(6)~~ In an embodiment,~~The colored resin composition according to (5), wherein~~ the weight ratio of the titanium nitride compound particles to the total weight of the black light-shielding material is 20 to 80% by weight.

~~(7)~~ In a second aspect, there is provided a~~A~~ resin black matrix substrate obtained by applying the black resin composition as defined above~~according to any one of (4) to (6)~~ onto a transparent substrate and forming a pattern.

EFFECTS OF THE INVENTION

[0014]

Through the use of the colored resin composition of the present invention, a resin black matrix having a high adhesion and a high chemical resistance can be easily obtained; and a black matrix substrate with excellent reliability can be obtained.

BEST MODE FOR CARRYING OUT THE INVENTION

[0015]

The present invention will now be described in more details.

[0016]

The colored resin composition according to the present invention comprises at least (A) a color pigment; (B) an alkali-soluble resin, (C) an adhesion promoter and (D) an organic solvent. The composition comprises as the (C) adhesion promoter at least a silane coupling agent having a specific structure.

[0017]