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METHOD OF FORMING MULTICOLOR
COATING COMPOSITIONMelvin Schwefsky, Union, N. J., assignor to United
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This invention relates to multicolor coating compositions.

An object of this invention is to provide a single coating composition including as ingredients thereof, a plurality of different colorants, such composition being applicable to a base to form a continuous coating in which the individual colors are surface related to each other in a predetermined manner.

Another object of this invention is to provide a composition of the character described which includes a film forming vehicle, a plurality of different colorants and a protective colloid for maintaining the colors in discrete relation to each other.

A further object of this invention is to provide a composition of the character described which includes a plurality of different colorants in predetermined proportions and which is adapted to form a coating on a base wherein the separate colors are disposed in discrete relation to each other in particulate form, the colored particles being of substantially predetermined size.

Still a further object of this invention is to provide a method of forming a multicolor coating composition from a plurality of differently colored lacquer bases which are suitably combined with a protective colloid in aqueous suspension whereby the different colors are maintained in discrete relation to each other.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The composition of this invention is essentially formed by providing an organic film forming base composition which may include nitrocellulose or various synthetic resins as the major ingredient thereof, combined with various modifying agents such as driers, plasticizers, gums and mixtures of aromatic and aliphatic solvents.

Each of the desired colorants in the form of organic or inorganic pigments, dyes or the like, is mixed with suitable mill base and taken up with clear film forming base. Each of the colored film forming base portions is then mixed with a protective colloid such as methyl cellulose in aqueous suspension. The several colored portions are then mixed to form the final composition.

It has been found that such a composition is stable in storage and is adapted to be applied to a base to form a continuous coating in which the

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several colors distribute themselves over the base in a discrete manner. By suitably proportioning the several colors and controlling the mixing of the ingredients predetermined color patterns may be produced.

The following examples illustrate the invention:

Example I

10 A clear film forming lacquer base is prepared in accordance with the following formula:

Parts by weight	
Nitrocellulose ($\frac{1}{2}$ second viscosity) -----	12.20
Nitrocellulose ($\frac{1}{4}$ second viscosity) -----	4.00
15 Hydrogenated methyl rosin ester -----	3.25
Butyl acetyl ricinoleate -----	0.75
Damar gum -----	1.44
Maleic gum -----	1.80
Blown soya oil -----	12.00
20 Shellac (French varnish) -----	5.25
Ethyl acetate -----	13.70
Toluol -----	15.60
Diisobutyl ketone -----	10.50
Methyl amyl alcohol -----	7.87
25 Denatured ethyl alcohol -----	11.52
Naphtha -----	.12
	100.00

30 There is also prepared an aqueous composition having the following formula:

Parts by weight	
Water -----	94.0
Methyl cellulose (15 cp. viscosity) -----	4.0
35 Methyl cellulose (400 cp. viscosity) -----	2.0
	100.0

40 Assuming that 4 gallons of a multicolor composition is to be made up, such composition having black and white colorants as ingredients thereof, 1.5 pounds of suitable mill base such as plasticized nitrocellulose or the like, is made up to include about 60% by weight of white pigment such as titanium dioxide. Also, 1.0 pound of mill base is made up with about 12% by weight of carbon black. Each of the colored mill base portions is taken up with clear lacquer of the type above described to make 1 gallon of colored lacquer.

50 The aqueous methyl cellulose composition is

heated within a range of from about 45° to about 70° C. The 1 gallon lot of white lacquer is mixed and agitated with about ½ gallon of the heated aqueous methyl cellulose composition, the agitation being controlled to produce a desired particle size with respect to the coolant. After suitable agitation, a ½ gallon of water is added, thus giving 2 gallons of white lacquer with the color substantially suspended in particulate form within the lacquer vehicle.

The foregoing procedure is repeated for black lacquer to provide 2 gallons of end product with the black pigment in substantial suspension. The two colored lacquers are finally mixed together to provide the 4 gallons of a two color coating composition wherein the colors are in discrete relation to each other.

It is desirable to insolubilize the methyl cellulose content of the composition. Accordingly, glyoxal substantially equal in amount by weight to the methyl cellulose, is added to the final lacquer composition.

The thus formed coating composition may be stored over a long period of time without effecting any material change in the particulate relationship of the colored lacquers as they are substantially suspended in the mixture of solvents and water.

The completed coating composition may be readily applied to a selected surface such as wood, paper, fiber board or any other material exhibiting a degree of porosity, by means of a spray gun or the like. The applied coating will dry in approximately 2 to 4 hours, leaving a continuous decorative and protective coating which exhibits a multicolor design. The design will be made up of the individual colors distributed over the surface in accordance with the relative proportions of the individual colors and will appear in more or less particulate form. The size of the particulate colors will be governed by the control of the mixing of the ingredients of the composition. The color design will be substantially uniformly repetitive over an extended surface, as far as the human eye is concerned.

The glyoxal in the composition will insolubilize the methyl cellulose content of the coating.

It is understood that other colloidal materials which may be dissolved or suspended in water, may be used in lieu of methyl cellulose. For example, other cellulose ethers such as ethyl cellulose, sodium carboxymethyl cellulose, hydroxyethyl cellulose, and the like may be used. These materials may be used in different viscosities and combinations thereof. The colloid content of the original aqueous composition may vary between about 2% to about 6% by weight.

It is apparent that within the coating composition the relationship between the inner phase constituted by the colored lacquers, and the outer phase constituted by the protective colloid in aqueous suspension, is modified by the decreased solubility of the colloid in the heated aqueous medium in the presence of the mixed solvents of the inner phase. In addition, the final addition of water serves to further stabilize the particulate condition within the composition.

While the water content of the outer phase has been divided in a 1:1 ratio in the foregoing example, such ratio of the water used to suspend the colloid and the water used as a diluent may be varied from 1:2.33 to 2.33:1, by volume.

Any number of colors may be combined to make up any desired color pattern for a given

composition. The colorants used in conjunction with the lacquers may be of an organic nature such as azo pigments of the toluidine red, Persian orange, or lithol red type. Alternatively, inorganic colors such as iron cyanide blues, iron oxide reds and yellows, may also be used. The total colors used in the inner phase may range up to 20% by weight of the phase.

The inner and outer phases may be combined in varying proportions of from about 50% to about 70% of the inner phase to from about 50% to about 30% of the outer phase, by volume.

Example II

A film forming lacquer base is prepared substantially as described in Example I, except that vinyl resin compounds replace the nitrocellulose as the organic film forming ingredient. Various vinyl resins well known in the lacquer art may be used, together with suitable solvents, plasticizers, etc. The colorants are ground or otherwise compounded with mill base as previously described and taken up with clear lacquer, respectively. The aqueous suspension of cellulose ether is heated, combined with the separate colored lacquers, agitated and diluted with the balance of the water, as previously described. The individually prepared colored lacquers are finally combined and treated with glyoxal, to form the final, multicolor coating composition.

Example III

A clear lacquer is formed substantially as described in Example I, using an alkyd resin in lieu of the nitrocellulose. Various alkyd resins, well known in the art may be used, including the linseed oil modified types. The lacquer composition is suitably compounded with modifiers, solvents, plasticizers and the like, to provide the base lacquer which is further compounded with color and a protective colloid, in the manner previously described.

It is understood that the colors may be ground in various vehicles before adding the same to the lacquer vehicle. The colors may be selected in any combination without fear that they may blend in the composition. Thus any color pattern may be suitably prepared in accordance with any desired decorative effect. The drying time of the applied composition will be essentially measured by the proportion of organic solvents and water in the composition, as well as the porosity of the base being coated.

The glyoxal added to the coating composition for the purpose of insolubilizing the cellulose ether content thereof, may be used in amounts varying between about 1.2% to about 5.0% by weight, calculated on the basis of the total water used.

It is understood that the foregoing examples are illustrative of the invention and that many different embodiments may be made of this invention without departing from the scope thereof, and therefore it is not intended to be limited except as indicated in the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A method of forming a multicolor coating composition comprising providing a plurality of differently colored lacquer portions and mixing each of said portions with an aqueous suspension of a cellulose ether which is more soluble in cold water than in hot water, while said suspension is hot, and combining said mixtures.

2. The method of forming a multicolor coating

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ing composition comprising providing a plurality of differently colored lacquer portions, mixing each of said portions with an aqueous suspension of a protective colloid at an elevated temperature, diluting each of said mixtures with water and combining said diluted mixtures.

3. The method as set forth in claim 2, wherein the water in said suspension bears a ratio to said diluent of about 1:1 by volume.

4. The method of forming a multicolor coating composition comprising providing a plurality of differently colored lacquer portions and a heated aqueous suspension of methyl cellulose, mixing and agitating about 2 parts by volume of each lacquer portion with about 1 part by volume of said suspension, adding about 1 part by volume of water to each of said mixtures and combining said mixtures.

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