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PIGMENT PASTE

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My invention relates to coating compositions and more particularly to compositions which can be dried to a wrinkle finish. The invention is applicable for compounding wrinkling varnishes and enamels having a viscosity suitable for spraying or brushing without using blown oils. This materially reduces the cost and provides an improved wrinkle finish product.

Wrinkle finishes as heretofore made in the art have been compounded from so called "wrinkling oils" which oils comprise raw China-wood oil, blown drying oils, such as China-wood, linseed, perilla, oiticica, etc. Other paint and varnish oils of the so called "non-wrinkling" type, such as soya bean, chia, walnut, hempseed, lumbang, poppy seed, sunflower seed, safflower seed, castor, fish, etc. may be utilized. Large amounts of the non-wrinkling oils, however, cannot be used in the formulation of wrinkle finishes; otherwise the wrinkling of the finish on drying is inhibited. Prior to my invention it has been necessary to use blown or pre-oxidized oils in compounding wrinkle finishes in order to obtain the most satisfactory results. This was particularly true where wrinkle finishes of sprayable consistency were desired.

The disadvantage of using blown oils lies in their instability. This instability results from the pre-oxidation of the oil which oxidation continues in a progressive manner after termination of the blowing treatment. At the beginning of the treatment the oil is soluble in the conventional petroleum or coal tar solvents but as oxidation progressed the oil becomes increasingly less soluble until finally it precipitates out in a rubber-like mass. This renders the wrinkle composition unfit for use. Wrinkle finish coating compositions comprising blown oil constituents, therefore, cannot be stored for any length of time before use.

It has also been found that in using wrinkle coating compositions made with blown oils a wrinkle finish having very fine texture cannot be produced, the tendency being for the finish to form a coarse or heavy textural wrinkle pattern on drying.

It is an object of this invention to compound wrinkle finish compositions which are stable on storing and can be readily modified so as to produce various textural wrinkle patterns upon drying.

Another object of this invention is to eliminate the necessity of using blown oils in compounding wrinkling compositions.

Another object of this invention is to provide a wrinkle varnish or enamel composition which is comparable to similar finishes made using blown oils.

Another object is to provide a wrinkle finish composition which can be blended with wrinkling varnish or pigment ground in drying oil so as to produce a coarse, medium or fine textural wrinkle pattern.

Another object is to compound a wrinkle coating composition comprising wrinkling paint oils to produce a wrinkle finish adapted for brushing or spraying which dries to a very fine textural wrinkle pattern.

Another object is to produce wrinkle finish compositions which can be mixed with drying oil fatty acids to produce the desired pattern or texture of wrinkle finish.

To eliminate the use of blown oils in the formulation of wrinkle finishes of this invention, I employ a wrinkling varnish base having a typical formula as follows:

Varnish "A—1"

Modified phenol aldehyde resin ("Amberol" or "Beckacite")	pounds	100
Lead acetate or linoleate	do	5–9
Raw China-wood oil	gallons	15–25
Bodied linseed oil	do	2–5
Solvent naphtha	do	8–10
Toluol	do	18–25

Varnish "A—2"

Modified phenol aldehyde resin ("Amberol" or "Beckacite")	pounds	100
Lead acetate or linoleate	do	5–9
Raw China-wood oil	gallons	12–20
Bodied perilla oil	do	5–10
Solvent naphtha	do	8–10
Toluol	do	18–25

Varnish "A—3"

Modified phenol aldehyde resin ("Amberol" or "Beckacite")	pounds	100
Lead acetate or linoleate	do	5–9
Raw China-wood oil	gallons	5–10
Bodied oiticica	do	12–20
Solvent naphtha	do	8–10
Toluol	do	18–25

In the foregoing varnish formulae the synthetic resins employed are of the oil soluble phenol aldehyde type, typical formulae and method of making which are shown in United States Patents 1,623,901 and 1,632,113.

It will be understood that various other resins may be utilized in place of those mentioned. Resins which are suitable are Kauri, dammar, Congo, "Cumar," pontianak, Manila, Zanzibar, copal, and the like. Further other phenol formaldehyde resins of the rosin, fossil resin and ester gum modified type which are readily compatible with the oil vehicle may be used. Also glycerol phthalic resins of the oil soluble type may be utilized, or mixtures of the above resins.

Other wrinkling paint oils such as poyok, pari-

narium oils or equivalent oils containing poly-conjugated double bond linkage may be substituted for the wrinkling oils mentioned in the formula. The bodied linseed oil employed is the grade known in the trade as "varnish linseed." This product comprises linseed oil which has been processed by heat treating the same between 575 to 600 degrees F. until a desired degree of viscosity is obtained. Similarly the bodied perilla oil utilized has been bodied by heat treating in the same manner as in making bodied linseed oil. The oiticica oil used has been bodied by heat treating to a temperature around 450 to 550 degrees F. for an hour to an hour and a half.

The preferred method of making varnishes "A—1," "A—2" and "A—3" is to heat all the China-wood oil together with approximately ¼ to ¾ of the resin in a vessel to a temperature around 540 degrees F. Thereafter the metallic drier, remainder of the oil and the resin are added. When the resin is dissolved the product can be cooled and thinned with solvent or it can be heated longer to obtain a higher viscosity before thinning.

I have discovered, however, that if the varnish is cooled quickly after the second portion of resin is dissolved, a clear wrinkle varnish can be made having improved spraying and wrinkling properties. The essential step in making varnishes "A—1," "A—2" and "A—3" is the sudden chilling or cooling of the heat treated oleoresinous mass immediately at the end of the heat treatment. This may be done in any suitable manner such as by the application of cold water or by refrigeration.

This method of making the wrinkle finish composition provides a sprayable wrinkle finish product which is comparable with that made with blown oils and does not have the disadvantage as regards instability on storing. The heat treatment in making the varnishes, it will be understood, may be varied between a temperature range of 450 to 550 degrees F., depending upon the particular product desired, but preferably the heating is conducted above 500 degrees F.

By maintaining the percentage amount of the total solids in the composition the same and heating the product for different lengths of time, I can regulate the viscosity of the varnish. The longer the varnish is heated the higher becomes its viscosity and correspondingly the shorter the period the lower viscosity. This is true even though the amount of solvent or thinner added may be the same in both cases.

In making a clear wrinkle composition from the above varnishes "A—1," "A—2" or "A—3" about 2 to 5 per cent of a liquid drier is added to the varnishes. A drier composition which has been found to be very satisfactory for this purpose is as follows:

Liquid drier "A"

Cobalt linoleate solid	pounds	12–16
China-wood oil fatty acids	do	8–10
Toluol, xylol, petroleum naphtha or coal tar solvent	gallons	6–8

Other examples of liquid driers which may be utilized are as follows:

Liquid drier "B"

Lead linoleate	pounds	5–10
Cobalt acetate	do	2–6
Linseed oil fatty acids	do	2–5
Toluol, xylol, petroleum naphtha or coal tar solvent	gallons	6–8

Liquid drier "C"

Lead linoleate	pounds	4–8
Manganese borate	do	2–5
Cobalt acetate	do	1–3
Drying oil fatty acids (China-wood oil, linseed, etc.)	pounds	5–8
Toluol, xylol, petroleum naphtha or coal tar solvent	gallons	6–9

For producing a wrinkle finish composition of the desired textural wrinkle finish pattern the above varnishes "A—1," "A—2" and "A—3" may be made having relatively low or high viscosities as determined by the Gardner-Holdt standards for varnish. In general the higher the viscosity of the varnish the coarser the texture of the wrinkle finish.

Where a finer textural pattern of wrinkle finish is desired than can be obtained by the use of a low viscosity varnish, a varnish-like solution of drying oil fatty acids may be incorporated in the above varnishes. The following examples are typical:

Varnish B

China-wood oil fatty acids	pounds	8–10
Toluol or xylol	gallons	1

Varnish C

Linseed oil fatty acids	pounds	2–5
China-wood oil fatty acids	do	3–8
Toluol or xylol	gallons	1

By adding various proportions of varnish B or varnish C to the low viscosity wrinkle varnishes "A–1," "A–2" or "A–3," the texture or pattern of the wrinkle produced on drying is modified. The higher the proportion of varnish B or C added to the varnishes the finer the texture of the wrinkle finish produced.

In making pigmented wrinkling enamels the desired color pigment may be ground into the varnishes "A–1," "A–2" or "A–3." Owing, however, to the volatility of the solvent used in preparing varnishes "A–1," "A–2" and "A–3" it is preferable to use a special grinding vehicle for this purpose. A typical example of this is as follows:

Varnish D

Modified phenol aldehyde resin ("Amberol" or "Beckacite")	pounds	100
Lead acetate or linoleate	do	5–9
Raw China-wood oil	gallons	15–20
Bodied linseed oil	do	2–5
Toluol or xylol	do	8–12
High-boiling petroleum naphtha	do	35–50

Varnish D is made in a like manner as varnishes "A–1," "A–2" and "A–3" but in this instance the heat treatment is maintained to obtain a heavy viscosity product. This grinding varnish is then mixed with the conventional paint pigments to make a paste of the desired color. Thereafter it is passed through a paint mill to thoroughly disperse the pigment in the vehicle. As an example of a pigmented white paste the following formulae are typical:

White paste 1–A

Titanium oxide	pounds	8–10
Varnish D	gallon	1

White paste 1–B

Titanium oxide	pounds	7–9
Zinc oxide	do	1–1½
Varnish D	gallon	1

Zinc oxide is added in this instance to inhibit any yellowing tendency on baking.

Green paste 1-C

Chrome green	pounds	5–7
Blanc fixe ($BaSO_4$)	do	3–4
Varnish D	gallon	1

Wrinkling enamels made with the above pastes would have the following formulae:

White wrinkling enamel 1

Paste 1–A	pounds	2–3
Clear wrinkling varnish "A–1," "A–2" or "A–3"	gallon	1

White wrinkling enamel 2

Paste 1–B	pounds	2–3
Clear wrinkling varnish "A–1," "A–2" or "A–3"	gallon	1

Green wrinkling enamel

Paste 1–C	pounds	2–3
Clear wrinkling varnish "A–1," "A–2" or "A–3"	gallon	1

In the above formulations where the wrinkling varnish employed is of high viscosity the texture of the wrinkle will be coarser than that produced by a varnish of lower viscosity as heretofore explained. To obtain finer textural wrinkle finish patterns in the case of enamels, I add a paste comprising an inert pigment. A typical formula is as follows:

Inert paste 1

Asbestine	pounds	8–10
Varnish D	gallon	1

Inert paste 2

Magnesium carbonate	pounds	3–5
Diatomaceous earth	do	5–7
Varnish D	gallon	1

In place of the inert pigments mentioned in the formula it will be understood that other materials may be utilized, for example whiting, "Surfex," which is a treated calcium carbonate pigment ($CaCO_3$) etc. Paste 3 produces a flat finish due to the use of the aluminum soaps.

In compounding enamels using the above varnishes and pigmented pastes different wrinkle textures are obtained by incorporating various amounts of the inert paste. There is, however, a limit as to the amount of inert paste which can be incorporated in the varnishes before the film becames perfectly smooth on drying. The amount depends on the particular inert pigment used in making the paste. When a sufficient amount of inert paste has been incorporated in the enamel, various amounts of drying oil fatty acid varnishes B or C may be added to vary the textural pattern of the wrinkle finish. In this way a wrinkle finish having a textural pattern so fine as to be practically invisible to the naked eye can be produced.

In drying the improved wrinkle finish of this invention, articles coated with the coating composition may be made to wrinkle by baking the coating at relatively low or high temperatures. For metallic and similar surfaces a temperature of 140 to 475° degrees F. may be employed. For application of the coating on wood, paper and similar materials a somewhat lower temperature on the order of 125 to 150° F. may be used. Ordinarily baking the finish at elevated temperatures accentuates the wrinkling and provides a harder finish. Where a highly elastic film is desired, the addition of small amounts of non-drying or semi-drying oils, such as castor oil, raw soya bean oil or similar materials may be made. Plasticizers such as dibutyl-phthalate or dicresyl phosphate also may be utilized.

The coating compositions of this invention are useful in the manufacture of various compositions such as varnishes, enamels, linoleum, imitation leather and coatings for paper, metal and the like. Different decorative effects can be produced by applying the wrinkling compositions and drying or baking them to a hard dry finish.

It will be understood that I desire to comprehend within my invention such modifications as come within the scope of the claims and the invention.

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

1. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment selected from the group consisting of asbestine and a mixture of magnesium carbonate wtih diatomaceous earth, a color pigment and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 5 to 25 gal., vegetable drying oil selected from the group consisting of bodied linseed oil, bodied perilla oil and bodied oiticica 2 to 20 gal., solvent naphtha 8 to 10 gal., and toluol 18 to 25 gal., said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

2. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment consisting of a mixture of magnesium carbonate with diatomaceous earth, a color pigment, and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs., a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 5 to 25 gal.; vegetable drying oil selected from the group consisting of bodied linseed oil, bodied perilla oil and bodied oiticica 2 to 20 gal.; solvent naphtha 8 to 10 gal.; and toluol 18 to 25 gal., said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

3. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment consisting of asbestine, a color pigment, and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 5 to 25 gal.; vegetable drying oil selected from the group consisting of bodied linseed oil, bodied perilla oil and bodied oiticica 2 to 20 gal.; solvent naphtha 8 to 10 gal., and toluol 18 to 25 gal., said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

4. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment selected from the group consisting of asbestine and a mixture of magnesium carbonate with diatomaceous earth, a color pigment, and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 15 to 25 gal.; bodied linseed oil 2 to 5 gal.; solvent naphtha 8 to 10

gal.; and toluol 18 to 25 gal.; said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

5. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment selected from the group consisting of asbestine and a mixture of magnesium carbonate with diatomaceous earth, a color pigment, and a cocked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 12 to 20 gal.; bodied perilla oil 5 to 10 gal.; solvent naphtha 8 to 10 gal.; and toluol 18 to 25 gal.; said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

6. A fine textured wrinkling enamel comprising an inert paste consisting of a grinding vehicle and a pigment selected from the group consisting of asbestine and a mixture of magnesium carbonate with diatomaceous earth, a color pigment, and a cooked wrinkling varnish base comprising the following formula: modified phenol aldehyde resin 100 lbs.; a drier selected from the group consisting of lead acetate and linoleate 5 to 9 lbs.; raw China-wood oil 5 to 10 gal.; bodied oiticica 12 to 20 gal.; solvent naphtha 8 to 10 gal.; and toluol 18 to 25 gal.; said inert paste imparting the fine wrinkle qualities to the resulting finished enamel.

WILLIAM A WALDIE.

CERTIFICATE OF CORRECTION.

Patent No. 2,275,239. March 3, 1942.

WILLIAM A. WALDIE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, lines 42 and 43, for "the formula" read --these formulae--; lines 46 and 47, strike out the words and period "Paste 3 produces a flat finish due to the use of the aluminum soaps."; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of May, A. D. 1942.

Henry Van Arsdale,

(Seal) Acting Commissioner of Patents.