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BRONZING MATERIALS

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5 Claims. (Cl. 106—290)

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My invention relates to gold and copper bronzing materials, and particularly to methods and materials for improving the stability of such bronzing compositions. In the preparation of these bronzing compositions it has been common practice to mix the flaked particles with the vehicle at the time the composition is to be used. The effectiveness of the coating composition depends to a large extent upon the property of the flaked bronze powder to leaf out and produce a good coverage of the surface to which it is applied. The clean flaked particles of bronzing powders such as gold and copper do not have the property of leafing sufficiently to be practicable for general use; and it has become common practice to treat the flaked particles with stearic or similar fatty acid to improve the leafing property of the powder. When this stearic acid coating is dissolved in the vehicle with which the powder is mixed, it raises the acid value of the vehicle and this higher acid value is very detrimental to leafing so that many gold and copper paints lose entirely the property of leafing in a few days. This loss of leafing is greatly accelerated by heat and agitation. When leafing is lost, the paint thins out and no longer dries to a bright well-covered surface.

One of the objects of my invention is to correct this defect and provide ready-to-use or so-called ready-mixed paints having better leafing, increased stability of leafing, and improved luster.

Another object is to provide an agent which may be added, with or without heat, to a gold or copper bronze paint, paste, or powder, or to the vehicle to be used in such a paint in order to obtain stability of the leafing powder and the luster of the finish.

In terms of greater detail, the stabilizing agent of my invention is a combination of (*a*) a neutralizing agent, (*b*) a leafing agent, and (*c*) a blending agent.

Neutralizing agents: I have found that the neutralizing agent overcomes the deleterious effect of the stearic acid coating on the surface of the powder. The most effective chemicals are polyethylene glycol, diethylene glycol, propylene glycol, and glycerine. High molecular weight aliphatic amines having mean molecular weights of primary amine content of from about 200 to 264, a mole combining weight of between 206 and 272, melting points of between 21° C. and 55° C. and a carbon chain length of from 6 to 18 may also be used. They are most effective when combined with paint, powder, paste or vehicle by the application of heat, such as with the use of a boiling water bath, and when the resulting paint is brushed or sprayed in the direct rays of the sun. They make bright, well-covered finishes when applied in the heat of the sun, while leafing may be sluggish when applied to cold surfaces or at low temperatures. Best leafing of the paints of my invention is obtained by a slightly warm paint applied to a warm surface. One of the best tests for leaf retention of the compositions of my invention is to bake them for a short time at 250° F.

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Vehicles.—If best gloss and quick drying are desired, I use a cumar resin vehicle, well known to all paint chemists, but such a vehicle makes a brittle paint which does not wear well. A more practical and durable vehicle is made as follows:

1301 Vehicle

	Grams
Bodied linseed oil	200
Solution of polymerized resinous material	200
Petroleum thinner, flash point about 90°, distillation range between 285° and 380°	100
	500

The bodied linseed oil is of low acid value, having a viscosity of 37 seconds. The solution referred to contains an unsaponifiable, resinous material derived by polymerization of di-olefins and tri-olefins of cracked petroleum, the resinous material having a low acid number and an iodine number usually between about 80 and 110. Both of these materials are well known to paint chemists, and are readily available as is also the aromatic paint thinner. The viscosity of this vehicle may be controlled by the amount of thinner added to the oil and resin. Viscosity limits for the vehicle should be about B to F. If fast drying is desired, I use a small amount of cobalt nuodex or equivalent, since cobalt is least detrimental to leafing of all the metal driers. This vehicle is a general all-purpose one, neither soft or brittle, and on account of its low acid value is very suitable for making gold or copper bronze paints. Many other vehicles may be used, other combinations being preferable on account of special requirements, and I claim no particular one but confine my invention and claims to the chemical agents used to produce stability of leafing properties.

Leafing agents.—For the leafing agent I use one or more of the following, stearic acid, myristic acid, palmitic acid, oleic acid and alumileaf. Alumileaf has been sold since 1940 under that name, and is covered by U. S. Patent No. 2,312,088

of February 23, 1943. It is a solution of chemicals, and may be described by claim 17 of said Patent No. 2,312,088 as "a composition of matter, a prepared agent adapted to be mixed with aluminum bronzing materials for stabilizing the leafing property of aluminum flakes after the same are mixed with a vehicle containing polymerizable material which consists essentially of a fatty acid of the class derived from the fats and oils, an anti-polymerization agent having the property in the presence of said fatty acid of inhibiting polymerization of the polymerizable material in the vehicle, and a solvent for the fatty acid and anti-polymerization agent, the fatty acid and anti-polymerization agent being dissolved in the solvent in the proportion of about one to ten parts of fatty acid to one part of anti-polymerization agent." The fatty acids and alumileaf have no property of helping the leaf retention of gold or copper paints when they are used alone, but when added to the neutralizing agent they are very beneficial.

Blending agents.—For this I prefer meta cresol, meta para cresol, diamyl phenol. The blending agents are used to prevent the separation of the leafing agent from the neutralizing agent. For example, if 60 grams of polyethylene glycol and 30 grams of alumileaf are mixed, they will separate on standing so that it is necessary for the user to shake them before adding to his paint, paste, powder or vehicle. However, if to these 90 parts, 5 to 10 parts of one of the blending agents are added to the mixture, no separation takes place and no shaking is necessary.

The following examples illustrate various formulations of paints made according to the present invention, but are not to be construed as limiting the invention to the disclosed specific proportions, or to any particular vehicle:

Example 1 (neutralizing agents)

	Grams
Polyethylene glycol	10
Gold or copper bronze powder	5
1301 vehicle	75
	90

Example 2

	Grams
Glycerine	10
Gold bronze powder	10
1301 vehicle	75
	95

Example 3

	Grams
Diethylene glycol	10
Gold bronze powder	10
1301 vehicle	75
	95

Example 4

	Grams
Propylene glycol	10
Gold bronze powder	10
1301 vehicle	75
	95

Example 5

	Grams
High molecular weight aliphatic amine	10
Gold bronze powder	5
1301 vehicle	75
	90

Example 6

	Grams
High molecular weight aliphatic amine	10
Gold bronze powder	10
1301 vehicle	75
	95

Example 7

	Grams
High molecular weight aliphatic amine	10
Copper or bronze powder	5
1301 vehicle	75
	90

Example 8

	Grams
Polyethylene glycol	5
Diamylamine	2½
Gold bronze powder	5
1301 vehicle	75
	87½

Examples of use of both neutralizing agent and leafing agent:

Example 9

	Grams
Polyethylene glycol	10
Stearic, myristic or palmitic acid	2½
Gold bronze powder	5
1301 vehicle	75
	92½

Example 10

	Grams
Polyethylene glycol	6
Alumileaf	3
Gold bronze powder	5
1301 vehicle	75
	89

Example 11

	Grams
Polyethylene glycol	5
High molecular weight aliphatic amine	5
Alumileaf	5
Gold bronze powder	5
1301 vehicle	75
	95

Example 12

	Grams
High molecular weight aliphatic amine	4
Alumileaf	2½
Gold bronze powder	5
1301 vehicle	75
	86½

Example 13

	Grams
High molecular weight aliphatic amine	10
Alumileaf	5
Gold or copper bronze powder	5
1301 vehicle	75
	95

Example 14

	Grams
High molecular weight aliphatic amine	10
Diamylamine	10
Gold bronze powder	5
1301 vehicle	75
	100

Example 15

	Grams
Stearic acid	1
Petroleum	1
High molecular weight aliphatic amine	6
Diamylamine	2
Gold or copper bronze powder	5
1301 vehicle	75
	90

Examples of use of neutralizing agent, leafing agent, and blending agent:

Example 16

	Grams
Polyethylene glycol	6
Alumileaf	3
Meta cresol	1
Gold bronze powder	5
1301 vehicle	75
	90

Example 17

	Grams
Polyethylene glycol	6
Alumileaf	3
Meta para cresol	1
Gold bronze powder	5
1301 vehicle	75
	90

Example 18

	Grams
Polyethylene glycol	6
Alumileaf	3
Diamylphenol	1
Gold bronze powder	5
1301 vehicle	75
	90

Examples of mixtures of chemicals:

Example 19

	Grams
Polyethylene glycol	60
Alumileaf	30
	90

This mixture should be shaken before use.

Example 20

	Grams
Polyethylene glycol	40
Stearic acid	10
Petroleum solvent	10
	60

This mixture should be heated in a boiling water bath to 200° F. in order to melt and mix in the stearic acid.

Example 21

	Grams
Polyethylene glycol	60
Alumileaf	30
Meta para cresol, meta cresol or diamylphenol	10
	100

Example 22

	Grams
Stearic acid	10
Petroleum solvent	10
Diamylamine	20
High molecular weight aliphatic amine	60
	100

This mixture should be heated to 200° F. in order to mix thoroughly. When cold, it is a white opaque semi-solid. May be used either hot or cold.

What I claim and desire to secure by Letters Patent is:

1. A bronzing composition consisting essentially of: a bronzing powder; a vehicle; a leafing agent; a neutralizing agent from the group consisting of glycerine, diethylene glycol, polyethylene glycol and propylene glycol; and a blending agent from the group consisting of diamylphenol, meta cresol and meta para cresol.

2. A bronzing composition consisting essentially of: a bronzing powder; a vehicle; a leafing agent composed essentially of a fatty acid; a neutralizing agent from the group consisting of glycerine, diethylene glycol, polyethylene glycol and propylene glycol; and a blending agent from the group consisting of diamylphenol, meta cresol and meta para cresol.

3. A bronzing composition consisting essentially of: a bronzing powder; a leafing agent; a neutralizing agent from the group consisting of glycerine, diethylene glycol, polyethylene glycol and propylene glycol; a blending agent from the group consisting of diamylphenol, meta cresol and meta para cresol; and a vehicle composed essentially of bodied linseed oil, an unsaponifiable resinous material derived by polymerization of di-olefins and tri-olefins of cracked petroleum and having a low acid number and an iodine number of between about 80 and 110 and a petroleum thinner.

4. A stabilized leafing composition for use with bronzing materials, composed of: a fatty acid leafing agent; a neutralizing agent from the group consisting of glycerine, diethylene glycol, polyethylene glycol and propylene glycol; and a blending agent from the group consisting of diamylphenol, meta cresol and meta para cresol.

5. As a composition of matter, a prepared agent to be mixed with gold or copper bronzing materials for stabilizing the leafing of such flakes composed of the following, 40 grams polyethylene glycol, 10 grams stearic acid and 10 grams petroleum solvent.

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