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STENCIL PASTE

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This invention relates to coating compositions and more particularly to those coating compositions used for making characters, figures and designs and which are applied by means of a stencil.

The consistency of coating compositions for satisfactory use as a stencil paste must be such that the material will leave a smooth surface when dried and will not run under the edges of the stencil. It must not be sticky in nature and must break cleanly from the design without stringing when the stencil is removed.

Many of the products heretofore used as stencil paste meet this requirement as to working properties. These commonly used pastes, are for the most part, dispersions of relatively large amounts of pigments having the desired color, in a limpid oil such as linseed or China-wood oil. Products of this nature have the disadvantage of being slow to dry and their high pigment content results in a brittle film which will not be as durable as the paint over which the stencil is placed. The result is that the letters fail before the background making it necessary to refinish the article. The high pigment content also results in poor gloss. While the gloss and drying can be improved by the use of varnishes and gums, the durability of the product made on this basis is, however, inferior to that of the oil type product and the working qualities are also inferior.

It has been known for some time that certain synthetic resinous compositions have durability superior to that of the oil type products. They can be highly pigmented without markedly reducing the durability. The gloss and flow of such materials are excellent. Heretofore it has not been possible, however, to use resinous materials of this sort as binders for stencil pastes owing to the fact that the products made from them have working qualities so poor that it has been impossible to apply them by means of a stencil.

These compositions are to be sharply differentiated from enamel-like coating compositions in which various false bodying agents are incorporated for the purposes of improving the brushing qualities of the product by changing the flow from the viscous to plastic type. The compositions referred to above are liquids which can be poured readily from one container to another and which will flow out in a thin layer when placed on a flat surface, whereas the stencil pastes referred to in this application cannot be poured, are relatively thick and will not flow out in a thin layer when placed upon a flat surface.

This invention has as an object the preparation of improved stencil pastes.

This object is accomplished by the following invention in which certain agents capable of imparting the necessary consistency, are incorporated into a coating composition comprising a pigment, a polyhydric alcohol-polybasic acid resin and a quantity of solvent somewhat less than usually used in making enamels and paints.

We have found that synthetic resins of the type referred to above can be used as a binder in stencil paste having excellent working properties, provided certain agents, which we designate as false bodying agents, and which will be further described, are added in order to impart the desired working properties to the composition. The addition of such agents sets up in the paste a weak but positive gell structure which prevents the material from running under the stencil as it would do ordinarily if sufficient volatile solvent is added to reduce the viscosity of the binder so that the paste can be easily worked.

As false bodying agents we prefer solutions of various soaps in appropriate solvents as water, mineral spirits or alcohol. The soaps of calcium, magnesium and other divalent metals are particularly effective. Their effectiveness is increased when used in conjunction with water soluble soaps of monovalent metals.

The following examples show by way of illustration, but not of limitation, several types of false bodying agents that are suitable for the purposes of the present invention.

EXAMPLE No. 1

Calcium oleate solution

	Parts
Calcium oleate.....	20
Mineral spirits.....	80
	100

The above ingredients are combined by heating for a short time in a steam-jacket kettle.

EXAMPLE No. 2

Ammonium stearate solution

	Parts
Ammonium hydroxide (sp. gr. 0.9)	0.41
Water	98.84
Stearic acid.....	0.75
	100.00

The stearic acid is broken up into small pieces and agitated with the other ingredients until dissolved.

EXAMPLE No. 3

Ammonium oleate solution

	Parts
Ammonium hydroxide (sp. gr. 0.9) -----	0.41
5 Water -----	98.84
Oleic acid -----	0.75
	100.00

10 The above ingredients are combined in the same way as those of Example 2.

15 Suitable compositions for stencil paste in which the false bodying agents are incorporated are given below. The composition of the particular resin used is given after the examples setting forth the stencil paste compositions.

EXAMPLE No. 4

White stencil paste

	Parts
20 Lithopone -----	46.1
Zinc oxide -----	23.1
Resin A -----	15.7
Drier -----	1.5
25 Ammonium stearate solution of Example 2 -----	2.3
Calcium oleate solution of Example 1 -----	4.8
Mineral spirits -----	6.5
	100.0

EXAMPLE No. 5

30 The same composition as Example 4 except that 23 parts of the lithopone are replaced by 23 parts of diatomaceous earth. The effect of the soap solutions described in the preceding examples is enhanced by the use of cellular or fibrous materials such as diatomaceous earth or "Asbestine."

EXAMPLE No. 6

40 The same composition as Example 4 except that basic lead carbonate is substituted for lithopone.

EXAMPLE No. 7

45 The same composition as Example 4 except that resin B is used instead of resin A.

EXAMPLE No. 8

Black stencil paste

	Parts
Carbon black -----	17.0
50 "Asbestine" -----	4.1
Resin B -----	64.0
Drier -----	4.1
Ammonium oleate solution of Example 3 -----	7.2
Calcium oleate solution of Example 1 -----	3.6
55	100.0

EXAMPLE No. 9

60 The same composition as Example 8 except that 7.2 parts of ammonium oleate solution are replaced by four parts of mineral spirits and 3.2 parts of calcium oleate solution of Example 1.

EXAMPLE No. 10

Red stencil paste

	Parts
65 Toluidine red -----	19.8
Barytes -----	28.6
Resin A -----	21.8
Ammonium stearate solution of Example 2 -----	15.4
70 Mineral spirits -----	12.8
Drier -----	1.6
	100.0

75 The linseed oil modified resin given in this ex-

ample, may, if desired be replaced by a resin modified by linseed oil acids such as indicated by resin C below.

The ingredients in the pastes described above are combined in accordance with the usual products of paint manufacture. 5

The following resins are illustrative of the class of polyhydric alcohol-polybasic acid resins especially suitable for the purposes of the present invention. These resins are made in the conventional way by reacting the ingredients in the proportions indicated. 10

Resin A

	Parts
Glycerol -----	12.8 15
Phthalic anhydride -----	28.0
Linseed oil -----	59.2
	100.0

Resin B

	Parts
Glycerol -----	15 20
Phthalic anhydride -----	35
Linseed oil -----	50
	100

Resin C

	Parts
Glycerol -----	17.1
Phthalic anhydride -----	27.1 30
Linseed oil acids -----	55.8
	100.0

As indicated by the above examples and as well understood by those skilled in the art, these oil-modified resins may be made from the drying oil or from the oil acids derived therefrom. 35

The ammonium soaps of Examples 2 and 3 which are given as ingredients of the stencil paste compositions may be replaced by other soaps of monovalent metals, as for instance, sodium oleate. 40

The relative proportions of pigment, resin, solvent and drier may be varied considerably as will be understood by those skilled in the art. Care must be taken, however, that the composition is not made too thin by the use of too much mineral spirits. The quantity of false bodying agents will, of course, vary somewhat with different compositions, but in all cases the amount is determined by the necessary consistency which must be imparted to the composition to identify it as a stencil paste. 45 50

The products of the kind described above can be used in all sorts of operations where a design is formed by means of a stencil. The material may be applied with a brush, a roller or other device. Pastes made from the synthetic resins as disclosed herein have, in addition to the other advantages noted, excellent durability as compared to those made from the ordinary type of oleo-resinous varnish. 55 60

Stencil paste made according to the present invention gives designs having durability and appearance definitely superior to those products in common use, particularly in resistance to fading. The drying speed consistent with the superior durability which can be secured is about three times that of the common type of product. Durability of 50 to 100% greater than the ordinary product may be expected. Because of the increased durability of the improved product the stencil design will last as long or longer than the coat over which it is applied which obviates the 65 70 75

necessity of refinishing the entire surface as is often the case when the ordinary types of stencil pastes are used.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that we do not limit ourselves to the specific embodiments thereof except as defined in the appended claims.

10 We claim:

1. A stencil paste composition comprising a polyhydric alcohol-polybasic acid resin, a small amount of dilute soap solution sufficient to prevent the composition from running when placed
15 under a stencil, a drier, and pigment in amount

sufficient to impart a paste-like consistency to said composition, said composition being incapable of being readily poured and flown out in a thin layer when placed upon a flat surface, said resin comprising the reaction product of a poly-
5 basic acid, a polyhydric alcohol and a modifying agent selected from the class consisting of drying oils and drying oil acids.

2. The stencil paste composition set forth in claim 1 in which the polybasic acid is phthalic
10 anhydride and the polyhydric alcohol is glycerol.

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