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LIGHT COLORED COATING COMPOSITION

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3 Claims. (Cl. 260—3)

This invention relates to coating compositions and more particularly to those coating compositions based upon resinous substances combined or modified with drying oils or drying oil constituents and more specifically to those coating compositions made from oil modified polyhydric alcohol-polybasic acid resins.

Coating compositions based upon synthetic oleo resinous materials have been known for some time. Very useful coating compositions can be made from phenol formaldehyde resins modified with rosin or other gums and incorporated into drying oils. Exceedingly useful coating materials can also be made from the oil modified polyhydric alcohol-polybasic acid resins. Coating compositions of this sort dry more rapidly than corresponding oleo resinous varnishes made from oils and natural gums. With the use of any of the above mentioned materials, however, it has heretofore been necessary to add to these compositions metallic soaps or driers. These substances are oxidation catalysts for the drying of oils. Their addition has been necessary in order to get sufficiently rapid drying speed and at the same time satisfactory durability and application properties. These driers are for the most part soaps or oils soluble salts of metals such as lead, manganese and cobalt.

Although the metallic driers very markedly increase the rate of dry or synthetic resin compositions including the polyhydric alcohol-polybasic acid resin type their use is attended with numerous disadvantages. One of the disadvantages attending the use of these driers resides in the fact that they are highly colored and even in small amounts impart an objectionable dark color to the product. This discoloration is more serious when the coating compositions are dried by baking rather than by exposure to the air at room temperatures. It also increases on exposure of the film in warm and dark locations out of contact with direct light. From a manufacturing standpoint the use of driers is also a disadvantage in that it gives difficulty in mixing and grinding operations causing the material to lump and to form skins. The tendency to skin over the surface also appears when the materials are placed in containers that are not completely filled. Many of these driers give rise to rapid oxidation which causes the films laid down from the compositions to dry on the upper surface only, remaining soft on the surface in contact with the article being coated for extended periods of time. Some of these driers are unstable in the solutions in which they are used and precipitate out on standing or on drying causing the surface of the film to be discontinuous and to present a rough appearance and sometimes a low gloss.

Attempts to substitute other oxidation catalysts for metallic driers in compositions containing oils and certain oleo resinous materials are not successful because the sufficiently rapid drying cannot be secured by the combination obtained. To the best of our knowledge, however, organic driers of the type disclosed herein have not previously been used to replace all or the major part of the drier in oil modified polyhydric alcohol-polybasic acid resinous coating compositions as more fully hereinafter set forth.

This invention has as an object the preparation of light colored coating compositions which shall be initially very light in color and shall retain their light color for extended periods of time even when exposed in unfavorable locations. A further object is to prepare light colored coating compositions which will not undergo undesirable oxidation on storage. A still further object is to prepare light colored coating compositions, the films of which will dry evenly thruout their entire thickness. A still further object is to prepare light colored coating compositions which will be stable in the liquid condition and which will not develop properties which will cause an uneven film having a low degree of gloss. A still further object is to prepare coating compositions which can be baked or force dried without becoming seriously discolored. Additional objects will appear hereinafter.

These objects are accomplished by the following invention in which organic peroxides are incorporated into coating compositions made with oil modified polyhydric alcohol-polybasic acid resins.

We have found that attempts to substitute organic peroxides for metallic driers in coating compositions containing oils or oleo resinous varnishes made from natural gums do not yield compositions that dry at a sufficiently rapid rate to be usable. We have found, however, that organic peroxides when used in conjunction with poly-

hydric alcohol-polybasic acid resins, as described below, yield coating compositions which dry in a satisfactory manner, have satisfactory application properties, and satisfactory film characteristics as will be more fully set forth.

Our improved coating compositions containing these substances and the method of preparing them are described in the following examples:

Example 1

Titanium dioxide	10.00
Lithopone	36.00
Zinc oxide	10.00
Resin A	26.00
Mineral spirits	13.00
Benzoyl peroxide	5.00
	100.00

Example 2

Lithopone	43.30
Zinc oxide	8.90
Resin A	30.80
Mineral spirits	13.80
Cobalt drier	.04
Benzoyl peroxide	3.16
	100.00

Example 3

Titanium dioxide	10.00
Lithopone	36.00
Zinc oxide	10.00
Resin A	26.00
Mineral spirits	13.00
Dibutyl peroxide	5.00
	100.00

Example 4

Lithopone	43.3
Zinc oxide	10.9
Resin A	12.8
Oil A	14.0
Benzoyl peroxide	5.2
Mineral spirits	13.8
	100.00

Example 5

Lithopone	43.3
Zinc oxide	10.9
Resin B	12.8
Oil A	14.0
Benzoyl peroxide	3.0
Turpentine	16.0
	100.0

In the last two examples we used a blend of oil soluble resin and bodied oil prepared in accordance with the method more fully set forth and claimed in copending application of John W. Iliff and Paul Robinson, Serial No. 462,408, filed June 19, 1930. This method of preparing the blend is characterized by the fact that oil soluble resins are prepared and these resins are dissolved in the cold in the bodied oil.

The oil designated A in Examples 4 and 5 was linseed oil, kettle bodied in the absence of air at a temperature of 525° F. to a viscosity of about 500 poises.

Example 6

Lithopone	42.30
Lead chromate	1.00
Zinc oxide	8.90
Resin A	30.80
Mineral spirits	13.80
Cobalt drier	.04
Benzoyl peroxide	3.16
	100.00

Example 7

A clear lacquer unusually light in color and resistant to color changes can be made from the following ingredients:

Resin B	50.0
Acetone	48.5
Benzoyl peroxide	1.5
	100.0

The compositions of polyhydric alcohol-polybasic acid resin referred to in the above examples are as follows:

Resin A

Glycerol	12.8
Phthalic anhydride	28.0
Linseed oil	59.2
	100.0

Resin B

Glycerol	12.8
Phthalic anhydride	28.0
Soya bean oil	59.2
	100.0

These resins are preferably made by heating the drying or semi-drying oil with the glycerol or other polyhydric alcohols until the alcohol goes into the solution in the oil. The mixture of glycerides so formed is then heated with phthalic anhydride, or other polybasic acid, until esterification occurs.

Since the specific details of this method of making the resins forms no part of the present invention, attention is directed to the co-pending application of Paul Robinson, Serial No. 370,727, filed June 13, 1929, for a fuller disclosure thereof. It is understood, however, that the present invention is not limited to this particular method of making the resins but other processes known to those skilled in the art may be used.

It is to be understood that the benzoyl peroxide or dibutyl peroxide mentioned in the examples may be replaced by other organic peroxides such as dioleyl peroxide or dinitro dibenzoyl peroxide. Likewise, resins made with different polyhydric alcohols and polybasic acids, and with varying proportions thereof, may be used instead of the specific resins mentioned. It is desirable, however, in the practice of the present invention to keep the oil glyceride present in the resin from greatly exceeding 65% because the composition will then dry too slowly to be satisfactory for most purposes unless it also contains considerable amounts of metallic driers. Other oils such as China-wood oil may be substituted for the linseed or soya bean oil, although the advantages of the invention are not so apparent if these oils are initially dark in color.

Resins may be made from the oil acids instead of the oils if so desired, although the advantages

in this case are also not so apparent since the oil acids are dark colored.

It is to be understood that the term "oil modified polyhydric alcohol-polybasic acid resin" mentioned in the claims refers to resins made by reacting, as indicated above, or in any suitable way, a fatty oil of the drying or semi-drying type, or the corresponding fatty oil acids, with a polybasic acid and a polyhydric alcohol.

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.

We claim:

1. A rapid drying coating composition comprising an oil modified polyhydric alcohol-polybasic acid resin and a drier for said composition which comprises a major proportion of an organic peroxide, said resin being selected from the class consisting of drying and semi-drying oil modified resins.

2. The composition set forth in claim 1 in which the organic peroxide is selected from the class consisting of benzoyl peroxide, dibutyl peroxide, dioleyl peroxide and dinitro dibenzoyl peroxide.

3. The coating composition set forth in claim 1 in which the resin is a glyceryl phthalate resin.

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