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COATED PAPER

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This invention relates to the method of coating paper and packaging materials with hydrocarbon products such as paraffin wax, petrolatum, and refined oils.

When paraffin wax, petrolatum, refined oils, or white oils are used to coat or impregnate paper and packaging materials it has been found that these hydrocarbon products deteriorate rapidly and form undesirable odors resembling a rancid odor. Consequently, the utility of the paper as a means for wrapping food products is greatly impaired. Even though antioxidants may have been added to the oil or wax prior to its impregnation in the paper, it has been found that the thus treated paper still has the tendency to develop rancid odors in relatively short periods of time.

One of the objects of my invention to to prepare a paper or packaging material, of the cellulosic type, coated with paraffin wax, petrolatum, or refined mineral oils which may be used to wrap food products such as bread, butter, lard and the like. Papers prepared in accordance with my process may be stored for long periods of time without forming racid odors. Consequently the food products or materials encased with the coated paper will not become contaminated with undesirable odors which result from the deterioration of the oil or wax in the paper.

I have discovered that paper is a pro-oxidant for paraffin waxes and refined mineral oils and that when such oils or waxes are used to coat or impregnate paper, their stability is quickly impaired. For example, a paraffin wax, petrolatum, or refined mineral oil which can be stored at room temperature for as long as several years before becoming racid, will become rancid in as little as two or three months when stored as waxed, petrolatum-impregnated, or oiled paper. Furthermore, when paraffin waxes and refined oils containing a small percent of antioxidants are used to impregnate paper, it has been found that the wax or oil developed rancid odor in a much shorter time than the same wax or oil before its impregnation in the paper.

I have discovered that by impregnating or covering the surface of paper with an antioxidant prior to the application of paraffin wax, petrolatum, refined wax, or a refined oil that the catalytic effect of the paper upon the coating will be greatly retarded. In carrying out my invention, the paper is impregnated with an antioxidant before adding the paraffin wax or oil coating. This operation may be performed in many ways, for example, the paper is passed through an aqueous solution of the antioxidant and then permitted to dry. The thus treated paper is then passed through a bath of molten paraffin wax or refined oil in order to apply the coating. By this means, the interface between the paper and wax or paper and oil contains an antioxidant which destroys the prooxidant effect of the paper upon the hydrocarbon material.

The antioxidants may be applied to the paper in any suitable manner, for example, when the paper is made in the conventional type of process a water bath containing the antioxidant may be placed between the paper presses and the drying rolls. If desired, a solution of the antioxidant may be sprayed onto the paper at any point in its process of manufacture providing precautions are taken to prevent substantial amounts of the antioxidants from being washed out of the finished product. The antioxidant may also be applied to the paper in the vapor phase; the paper being passed through a chamber containing steam and the vapor of the antioxidant to be used, e. g. beta-naphthol. In drying paper that has been impregnated with the antioxidant, precaution should be taken not to overheat the paper during the drying operation. Excessive heating during the drying operation may partly destroy the effectiveness of the antioxidant.

In the event that the particular antioxidant to be used is not sufficiently soluble in water to prepare concentrated solutions, the paper may be soaked in a saturated aqueous solution or suspension of the antioxidant. Also volatile solvents may be used for the antioxidants, namely, ether, alcohol and the like, or emulsified solutions of the antioxidant. In preparing a paper impregnated with catechol, I have found that by soaking the paper in a 0.1% aqueous solution of catechol for about 15 minutes, a sufficient amount of the antioxidant will diffuse into the paper to destroy the pro-oxidant effect of the paper upon the hydrocarbon coating to be applied. Solutions containing various amounts of the antioxidants, for example 1% to 0.001%, may be employed in order to impregnate the paper and particularly the surface of the paper with the desired antioxidant. Also, solutions containing an admixture of the hereinafter mentioned antioxidants may also be employed.

The paraffin waxes having various melting points may be used to impregnate papers and package materials in accordance with my invention. Waxes having melting points from 122–124, 130–132 and 135–138° F., are examples of waxes that may be used. Refined oils, for example white

oils, having Saybolt viscosities at 100° F. ranging from 75 to 150 seconds, are generally used. Petrolatums may also be used. Waxes having higher and lower melting points than those given above as well as refined oils having higher and lower viscosities than those given above may also be used. My invention is not limited, however, to waxes, petrolatums and oils having the above physical properties.

Examples of the antioxidants which may be employed in my process are the classes of alkyl phenols, poly-hydroxy benzene compounds, naphthols, aromatic amines and aminophenols. Examples of the alkyl phenols are tri-butyl phenol, tertiary butyl phenol, tertiary alkyl phenols generally and octyl phenol. Examples of the poly-hydroxy benzenes and derivatives are hydroquinone, pyrogallol, catechol, alkylated dihydroxy benzene such as 1:2-di-methyl-3:6-dihydroxy benzene, 1:2-di-methyl-4:5-di-hydroxy benzene, 1:3-di-ethyl-2:5-di-hydroxy benzene, tertiary butyl catechol, ethyl pyrogallol, alkoxy hydroxy benzenes such as methoxy hydroquinone, pyrogallol-1-methyl ether, ethoxy catechol and the like. Examples of the naphthols are alpha naphthol, beta naphthol, 1:2-di-hydroxy naphthalene and 1:4-di-hydroxy naphthalene. Examples of the aromatic amines are alpha naphthylamine, phenyl alpha naphthylamine, alkyl alpha naphthylamines such as the methyl and ethyl derivatives, poly amines such as para phenylene di-amine. Examples of the aminophenols are ortho-aminophenol, para-aminophenol, alkyl substituted aminophenols such as dimethyl para-aminophenol, di-butyl aminophenol, and di-ethyl aminocresol, aryl aminophenols such as phenyl-aminophenol, and aralkyl aminophenols such as benzyl aminophenol and the like.

The foregoing specification and examples will serve to define the scope of my invention and make its advantages apparent to those skilled in the art to which it pertains. The specific antioxidants mentioned are given for illustrative purposes and are not intended to restrict the scope of the invention. It will be evident that the invention is not limited to the specific hydrocarbon coating materials herein described.

I claim:

1. The method of preparing a hydrocarbon coated paper which is stable against oxidation, which comprises impregnating the paper surface with a small amount of tertiary butyl catechol and then coating the thus treated paper with a hydrocarbon coating material selected from the group consisting of paraffin wax, petrolatum and refined hydrocarbon oils.

2. A process of making a flexible sheet packaging material comprising first applying to the sheet packaging material a surfacing of an antioxidant which is spread over the entire surface thereof and then applying a non-antioxygenic water repellent coating material, said antioxidant being an ortho dihydroxy benzene.

3. A process of making a flexible sheet packaging material comprising first applying to the sheet packaging material a surfacing of an antioxidant which is spread over the entire surface thereof and then applying a non-antioxygenic water repellent coating material, said antioxidant being a catechol.

4. A process of making a flexible sheet packaging material comprising first applying to the sheet packaging material a surfacing of an antioxidant which is spread over the entire surface thereof and then applying a non-antioxygenic water repellent coating material, said antioxidant being a substituted catechol.

5. A process of making a flexible sheet packaging material comprising first applying to the sheet packaging material a surfacing of an antioxidant which is spread over the entire surface thereof and then applying a non-antioxygenic water repellent coating material, said antioxidant being catechol.

6. A process of making a flexible sheet packaging material comprising first applying to the sheet packaging material a surfacing of an antioxidant which is spread over the entire surface thereof and then applying a non-antioxygenic water repellent coating material, said antioxidant being ethoxy catechol.

7. The method of preparing a hydrocarbon coated paper which is stable against oxidation which comprises impregnating the paper surface with a small amount of an ortho dihydroxy benzene and then coating the thus treated paper with a hydrocarbon coating material selected from the group consisting of paraffin wax, petrolatum and refined hydrocarbon oils.

8. The method of preparing a hydrocarbon coated paper which is stable against oxidation which comprises impregnating the paper surface with a small amount of a catechol and then coating the thus treated paper with a hydrocarbon coating material selected from the group consisting of paraffin wax, petrolatum and refined hydrocarbon oils.

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