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OPAQUE WAXES AND METHOD OF PREPARING THE SAME

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This invention relates to improvements in the preparation of opaque waxes.

For certain uses, such as certain types of wax-coated papers and in the manufacture of certain types of candles, it is highly desirable to employ waxes which have an opaque appearance. In the past, materials, such as stearic acid, beta naphthol, ammonium stearate and palmitate, solid aliphatic alcohols and other compounds have been used as opacifiers in waxes. However, the necessity of using relatively large amounts of these materials makes the use thereof for this purpose economically undesirable.

Another method of making waxes opaque is to introduce air into the molten wax as the wax is being cooled to its solidifying point. However, wax so treated does not retain its opacity when the wax is heated above its melting point.

I have discovered that a permanent opaque wax can be prepared by introducing a gaseous medium, such as air, oxygen, carbon dioxide, nitrogen and inert hydrocarbon gases into the molten wax while the same is being cooled to its solidification point, to produce a froth-like mass which is made substantially permanent by means of stabilizers such as, for example, alkali sulfonic acid soaps, sodium stearate, hydroxy ethyl stearate, and alkyl xanthates. Other froth stabilizers I may employ are ammonium stearate, triethanolamine oleate, sodium or potassium soaps of the sulfuric acid esters of higher alcohols, such as lauryl, myricyl and cetyl alcohol, tetra alkyl ammonium soaps of fatty acids, sulfonic acids and the alkyl sulfonic acid esters. The presence of these froth stabilizers permits the heating of the wax froth to a temperature above the melting point of the wax without destroying the same. This is highly desirable since in the making of the candles and in the coating of paper it is necessary to bring the wax to a temperature above its melting point in order to fill the candle molds and to apply the wax to the paper.

I have found that the opaque wax can be best prepared by heating the wax, for example, paraffin wax, to a temperature of from about 5° F. to about 50° F. above its melting point, and introducing from about 0.2% to about 10% and preferably from about 0.5% to about 2% of the froth stabilizer to the molten wax. The mixture is then cooled to a temperature within about 20° F. above its solidifying point and the wax mixture vigorously blown with air, gaseous carbon dioxide, nitrogen and any other suitable gaseous medium. The wax may be allowed to solidify during the blowing. The occluded or dissolved

air or gas in the melted wax forms minute bubbles when the wax solidifies which imparts to the wax a fine glossy opaque appearance. The presence of the froth stabilizer permits the reheating of the wax to a temperature above its melting point and retaining a greater portion of the minute bubbles on resolidification. I may use a colloid mill or other mechanical device to assist in producing the desired froth.

Opaque wax-coated paper and opaque candles may also be obtained by dissolving oxygen, air, carbon dioxide, or gaseous hydrocarbons, such as propane, butane, etc., in the molten wax under pressure just before the wax is to be applied to the paper or to be poured into the candle molds. As the wax cools the pressure is released, thereby causing the occluded gas to be effused from the wax, thus forming minute gas bubbles which are encased in the solidified wax and give the wax an opaque appearance.

For this purpose the use of a liquefied normally gaseous hydrocarbon is highly efficient. The liquefied normally gaseous hydrocarbon, such as propane, butane, or mixtures thereof, may be dissolved in the wax under pressure. As the pressure is released the liquefied normally gaseous hydrocarbons will vaporize, forming bubbles in the wax and at the same time cool the wax to its solidification temperature.

This process of preparing opaque waxes is usually applied to mineral waxes and paraffin waxes having melting points ranging from about 110° F. to about 160° F. However, I prefer to use paraffin waxes having melting points ranging from about 120° F. to about 145° F. as they better resist breaking of the emulsion or foam on reheating.

I may also produce my air-wax mixture by comminuting or powdering the wax and extruding or molding the product therefrom, preferably after it has been warmed and softened to a degree which will permit it to cohere. By incorporating a stabilizing agent at the same time the wax-air mixture may be remelted without destroying the opacity of the wax. I may also add coloring matter, such as pigments and oil-soluble dyes to the comminuted or emulsified wax to obtain any desired tint.

I claim:

1. The method of preparing opaque paraffin waxes which comprises heating paraffin wax to a temperature above its melting point, dissolving a froth stabilizer in said melted wax in the absence of an aqueous medium and vigorously agitating said melted wax mixture with a gaseous

medium while the wax cools to its solidification point.

2. The method as described in claim 1 in which the froth stabilizer is a compound selected from the group consisting of alkali sulfonic acid soaps, sodium stearate, hydroxy ethyl stearate and alkyl xanthates.

3. The method of preparing opaque waxes as described in claim 1 in which the gaseous medium is a gas selected from the group consisting of air, oxygen, carbon dioxide, nitrogen and gaseous hydrocarbons.

4. The method of preparing opaque waxes as described in claim 1 in which the wax is a paraffin wax having a melting point between about 110° F. and about 160° F.

5. The method of preparing an opaque paraffin wax which comprises heating a paraffin wax having a melting point between about 110° F. and about 160° F. to a temperature of from about 5° F. to about 50° F. above its melting point, dissolving from about 0.2% to about 10% of a froth stabilizer in said molten wax in the absence of an aqueous medium and agitating the molten

wax mixture with a gaseous medium and cooling the wax to its solidification point.

6. The method of preparing an opaque paraffin wax which comprises heating the wax to a temperature above its melting point, dissolving a froth stabilizer in said molten wax, applying a pressure to said molten wax mixture, introducing a liquefied normally gaseous hydrocarbon into said molten wax mixture while the same is under pressure, releasing the pressure on said molten wax mixture whereby the said liquefied normally gaseous hydrocarbon is permitted to vaporize forming minute bubbles and at the same time cooling the wax to its solidification point.

7. The method of preparing opaque paraffin wax which comprises heating the wax to a temperature above its melting point, dissolving a froth stabilizer in said melted wax in the absence of an aqueous medium, cooling the wax mixture to a temperature at which the wax is softened to a degree which will permit it to cohere and comminuting said wax mixture.

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