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PREPARATION OF GELATIN COATINGS HAVING A ROUGHENED SURFACE

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This invention relates to a method of producing gelatinous coatings characterized by a roughened or matte surface.

In the manufacture of photographic film and paper, extreme surface smoothness of the gelatinous coating in the finished product is frequently disadvantageous while surface roughness is often a very desirable property. For instance, in the manufacture of sensitized paper when certain synthetic surfactants are used as coating aids the extreme smoothness of the surface of the product introduces a very serious handling problem due to the slippage of the sheets one over the other when they are stacked for cutting or any other purpose. In the case of photographic film, extreme smoothness of the surface of the final product may result from the type of drying conditions used as well as from the surfactants used as coating aids. In many types of products this extreme smoothness has come to be associated with static and ferrotyping difficulties in certain products.

One object of our invention is to provide a procedure for applying gelatinous coatings characterized by the incorporation in the gelatin coating composition of certain small insoluble particles. Other objects of our invention will appear herein.

We have found that by causing to precipitate in gelatin coating compositions, calcium, barium or magnesium salts of certain compounds that a matting effect is produced therein whereby the surface of the coating is definitely roughened. This is particularly the case where those materials have densities lower than the gelatin solution so that the roughening materials tend to concentrate in the surface of the gelatin layer and give a maximum matting effect. Some of the materials, the calcium, barium or magnesium salts of which give a roughening effect are the following: sebacic acid, tartaric acid, N-lauroyl sarcosine, abietic acid, rosin soap, cholic and maleopimaric acid. Where the gelatinous coating compositions already contains lime or magnesium ions such as due to hardness or to the use of a lime gelatin, the addition of one of the materials mentioned in an amount sufficient to cause the necessary precipitation within a reasonable time will result in the desired roughness effect. The resulting coating is also free of repellency spots. The following examples illustrate the preparation of gelatinous coating compositions containing therein roughness producing materials in accordance with our invention.

Example 1

To 80 grams of a 10% gelatin solution at 36° C., at least part of the solution being lime gelatin, were added 16.9 ml. of distilled water and 3.1 ml. of a 5% solution of sodium maleopimarate. The addition was carried out with mechanical stirring and maintained for 1 minute after the addition was completed. The resulting 8% gelatin solution was permitted to stand for 13 minutes. At the end of this time the solution was coated at a thickness of 0.02" on a 5 x 7-inch plate, chilled 15 minutes at 45–50° F. and dried on a chilled block under a stream of dry air at approximately 120° F. There was obtained a dry gelatin surface, extremely rough to the touch.

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Example 2

To 30 grams of an 8% gelatin solution prepared as described in Example 1, was added with stirring 50 ml. of distilled water at 36° F. forming a 3% gelatin solution. This solution was aged, coated and dried by the procedure described in Example 1. The dried gelatin coat obtained had a decidedly rough surface.

Example 3

To 40 grams of a 10% gelatin solution there were added 4 ml. of 1% calcium nitrate with stirring followed by 5.1 ml. of water and 0.66 ml. of a 5% solution of sodium maleopimarate. The 8% gelatin solution thus formed was allowed to stand at 35° C. for 2½ hours, and was then coated and dried as described in Example 1. A gelatin coating having substantial roughness was obtained.

Example 4

To 80 grams of a 10% gelatin solution having calcium ions present therein were added at 36° C. 15.6 ml. of water with stirring followed by the addition of 3.1 ml. of 5% aqueous sodium maleopimarate. The resultant solution was allowed to stand 13 minutes at 36° C. 1.3 ml. of 5% saponin solution were added with stirring and the 8% gelatin solution that was obtained was coated and dried as described in Example 1. A roughened gelatin surface was obtained.

Example 5

To 30 grams of an 8% gelatin solution prepared as described in Example 4 were added 50 ml. of distilled water to dilute the solution to 3% gelatin concentration. A coating was made therewith and the gelatin coating obtained was found to have substantial roughness.

Instead of imparting surface roughness to gelatinous coatings as described above, gelatin coatings may be adjusted to any desired roughness by adding only a partial amount of a solution such as obtained in Example 1 to a gelatin coating composition after the other additives have been incorporated therein.

We claim:

1. A method of preparing gelatin coatings having a matte surface which comprises supplying to an aqueous solution of gelatin a small proportion of an alkaline earth metal maleopimarate, applying the composition to a support therefor in the form of a thin layer and drying the thus formed layer.

2. A method of preparing a matte surface which comprises supplying to an aqueous solution of gelatin a small proportion of calcium maleopimarate, coating out the gelatin composition onto a surface in the form of a thin layer and drying the thus obtained coating.

3. A method of obtaining a matte surface which comprises incorporating in an aqueous solution of gelatin containing lime gelatin a small proportion of a water-soluble maleopimarate, coating out the composition thus obtained upon a surface and drying the thus formed coating.

4. A composition of matter adapted to provide a matte surface which comprises an aqueous solution of gelatin containing therein a small proportion of an alkaline earth metal maleopimarate.

5. A composition of matter adapted to the formation of coatings having a matte surface which comprises an aqueous solution of gelatin containing therein a small proportion of a calcium maleopimarate.

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