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INHIBITING OF FOAMING IN SYSTEMS CONTAINING GELATINE

Maurice L. Piker and Stephen C. Pool, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey

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This application relates to the prevention of foaming and frothing in a system containing gelatine, particularly in the comminution of scrap film by employing a liquid lower fatty acid ester of a monohydroxy aliphatic alcohol of 6–8 carbon atoms.

In the working up of scrap emulsion coated film to recover the cellulose ester and the plasticizers therefrom, it is customary to first subject it to a mechanical comminution in the presence of water to render it more susceptible to the treatments given and to facilitate handling. Foaming or frothing is an objectionable feature of this chopping operation, especially in warm weather, when the gelatine emulsion is more susceptible to the action of the warmer water which is present during the chopping operation. This foaming and frothing reduces the capacity of the containers in which the chopping is carried out, oftentimes causes overflowing thereof, and may even require the cessation of the operation, prevents observing of the progress of the comminution and, due to the lightness of the froth, some of it may be thrown from the vessel in which the chopping or comminuting takes place.

One object of our invention is to provide a method whereby the foaming and frothing of a fluid mass containing gelatine, such as a wet mass of scrap film, is prevented. Another object of our invention is to provide a method of comminuting film in which the film is not adversely affected and in which toxic conditions are absent.

We have found that the liquid lower fatty acid esters of the monohydroxy aliphatic alcohols of 6–8 carbon atoms are particularly suitable for use in controlling the foaming during the comminution of the scrap film, due to the effectiveness of those compounds in small quantities, the lack of toxicity of those compounds, the cheapness of members of that class and the fact that the film base is not adversely affected thereby, as regards either the flexibility, tensile strength, clarity, photographic quality or the stability of sheeting made therefrom.

These esters apparently cause rupture of any bubbles which might be formed in agitating water or other liquid containing some gelatine in solution or suspension and thereby prevent any foam formation. We have found that as little as .03 lb. of these esters per 100 lbs. of film scrap is sufficient to prevent foaming, although in practice the use of a little more ester, such as .05 or .06 lb., is preferred. Examples of compounds of this class, which are useful for this purpose and which can be obtained commercially at low price, are octyl acetate, such as 2-ethyl hexyl acetate, and secondary hexyl acetate. Other liquid lower fatty acid esters of the hexyl, heptyl and octyl alcohols might be employed, particularly if the price makes their use practical on a commercial scale. Although the acetic acid ester of these alcohols is ordinarily prepared and, therefore, would probably be used, nevertheless, other fatty acid esters, such as the propionates, butyrates, etc., may be employed, providing, of course, that the acid is not so high a homologue of acetic acid to result in an ester which is a solid.

Our invention is adapted both to the processes for recovering nitrate film scrap and that prepared from organic acid esters of cellulose. It is particularly adapted, however, to the recovery of cellulose nitrate from film employing nitrate as the base, as the comminution of that film must always be carried out under wet conditions to eliminate fire hazard. We have found that, even though a small proportion of one of these anti-foam esters should remain in a cellulose ester which is subsequently employed to prepare sheeting or film therefrom, the properties of the cellulose ester are not adversely affected. As our invention contemplates the use of only small amounts of the ester, the cellulose material, which is recovered, will have properties as good as that recovered from a similar scrap by a process in which our invention is not employed.

The following example illustrates the comminution of film in accordance with our invention:

2-ethyl hexyl acetate was sprayed through a very fine nozzle into the chopping apparatus along with a shower of water employed to wet the film scrap just before it reaches the chopping blades. This ester was applied at the rate of .06 lb. per 100 lbs. of emulsion coated film. It was found that in the chopping process the foam and froth, which are characteristically present, were absent and that the disadvantages and inconveniences usually associated with comminuting the film scrap were eliminated. The film base, which was cellulose nitrate, was thereupon separated from the water which was present, the water being free of foam and capable of being easily handled.

Although our invention is particularly directed to a comminuting process in which chopping is employed, nevertheless, it would be useful in any other instance where the wet scrap is broken up into smaller units. Our invention is especially valuable in cases where the scrap is separated into fine particles, because the greater breaking off or dissolving of the emulsion in such a process would contribute to the foaming. Various organic acid

esters of cellulose might have been employed for preparing the base of the scrap photographic film, such as cellulose acetate, cellulose acetate propionate or cellulose acetate butyrate and scrap recovery processes reclaiming this type of film are also included in our invention. Our invention is useful in film scrap recovery processes regardless of the cellulose derivative from which the film is made providing, of course, the film is comminuted while in a wet condition.

Our invention is generally useful to prevent the foaming of a fluid mass containing gelatine. For instance, after the film scrap has been separated from the water or other liquid used to soak it, the liquid may in some cases be subjected to agitation which would cause foaming. The presence of a small amount of one of the esters given would prevent this foaming and thereby facilitate the handling of the liquid.

We claim:

1. A process for inhibiting the foaming of a fluid mass containing gelatine which comprises incorporating a small amount of a liquid fatty acid ester of a monohydroxy aliphatic alcohol of 6–8 carbon atoms therein prior to an agitation of the mass, which is ordinarily foam-forming.

2. A process for comminuting emulsion coated film which comprises finely dividing the film while wet in the presence of a small amount of a liquid fatty acid ester of a monohydroxy aliphatic alcohol of 6–8 carbon atoms.

3. A process for comminuting emulsion coated film which comprises finely dividing it while wet in the presence of an acetate of a monohydroxy aliphatic alcohol of 6–8 carbon atoms.

4. A process for comminuting emulsion coated film which comprises chopping the wet film in the presence of a liquid fatty acid ester of a monohydroxy aliphatic alcohol of 6–8 carbon atoms.

5. A process for comminuting emulsion coated film which comprises chopping it while wet in the presence of a liquid fatty acid ester of an octyl alcohol.

6. A process for comminuting emulsion coated film, having a base of cellulose nitrate, which comprises finely dividing the wet film in the presence of a liquid fatty acid ester of a monohydroxy aliphatic alcohol of 6–8 carbon atoms.

7. A method of comminuting an emulsion coated film which comprises finely dividing the film while wet in the presence of 2-ethyl hexyl acetate.

8. A method of comminuting an emulsion coated film which comprises finely dividing the film while wet in the presence of secondary hexyl acetate.

MAURICE L. PIKER.
STEPHEN C. POOL.