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PROCESS FOR REMOVING WALLPAPER

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The invention relates, in general, to a process of removing and/or separating layers, sheets, films and the like by attacking the binding adhesive and to correlated improvements in compositions adapted for such processes.

The invention is particularly directed to a process of removing gummed labels, stamps, envelope flaps, wallpaper from walls and any other material secured to another material or surface by means of a water-soluble or water-sensitive adhesive. The invention is admirably suited for the removal of wallpaper from walls, ceilings or other surfaces. The task of removing wallpaper from walls involves considerable time and labor which materially affects the expense of redecorating a room.

Heretofore paperhangers have removed wallpaper by spraying or brushing the same with water to soften and/or dissolve the adhesive. The use of water alone is highly unsatisfactory in view of the time necessary for the water to penetrate the paper. This is especially true in those cases where washable papers have been used as they are highly sized, coated or treated to render them substantially water-resistant. In an attempt to facilitate the removal of wallpaper, the use of steam has been resorted to. Such a process involves the use of cumbersome and expensive apparatus which most of the smaller contractors can not or do not wish to employ. Moreover, the results obtained by the use of steam are not satisfactory in most cases.

It has further been proposed to remove wallpaper by spraying or brushing a gel or like plastic material comprising a hydrophilic colloid, water, a penetrating and a wetting agent. This proposal has enjoyed but limited success, due in part, to the cost of the product and due to the difficulty in handling the same.

The general object of the invention is to obviate the foregoing and other disadvantages.

A specific object of the invention is to provide an improved process of readily removing and/or separating sheets, films or the like secured by a water-soluble or water-sensitive adhesive.

Another object of the invention is to provide a composition for removing wallpaper and the like having improved wetting and penetrating properties.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

According to the invention, the process comprises treating a surface of a sheet of material which is adhesively secured to another sheet or

surface with an aqueous solution containing a sulfonated material having a high SO_3 content, preferably more than 10%. The invention also contemplates a composition for separating or removing adhesively secured sheets comprising an aqueous solution of a sulfonated material having a high SO_3 content, preferably more than 10%.

The invention accordingly comprises the several steps and relation of one or more of such steps with respect to each of the others, and a composition of matter possessing the characteristics, properties and relation of components, all of which will be exemplified in the following detailed disclosure, and the scope of the invention will be indicated in the claims.

It has now been discovered that the penetrating action of water, which serves to soften and/or dissolve the adhesive, may be greatly enhanced by incorporating therein a sulfonated material having a high SO_3 content. The materials found suitable for this purpose include sulfonated fatty oils, fatty acids and derivatives thereof, such for example as sulfonated castor oil, corn oil, fish oils, sperm oil, neat's-foot oil, linseed oil, lard oil, rapeseed oil, soya bean oil, cottonseed oil, etc., and their corresponding fatty acids, such as oleic, stearic, palmitic, ricinoleic, etc. Sulfonated fatty acid esters other than the glycerides may also be used. The sulfonated products may be neutralized in the usual manner with an alkali base. In some cases better penetration may be obtained by neutralizing the sulfonated products with nitrogenous bases as NH_3 , urea, alkylolamines, primary, secondary or tertiary amines, etc.

Products of the above type produced by the ordinary sulfonation processes contain about 4% to 10% SO_3 . While sulfonated products containing about 4% to 10% SO_3 have various industrial applications, they do contain an appreciable quantity of unsulfonated materials which apparently retard the penetrating and wetting properties of the product as a whole. Highly sulfonated products may now be obtained and one method of producing such products is disclosed in copending U. S. application for Letters Patent, Serial No. 128,600. The process of this latter application comprises extracting a sulfonated fatty acid, fatty glyceride or fatty derivative with a non-aqueous liquid consisting of a halogenated organic solvent for unsulfonated fatty material in the presence of sulfonated fatty material. A few examples of such solvents include inter alia, ethylene dichloride, propylene dichloride, orthochlorobenzene, di-

chlorethylether, trichlorbutane, etc. Specifically, the process comprises agitating the sulfonated material containing about 4% to 10% with a solvent of the aforementioned type, preferably at a relatively low temperature. The mixture is allowed to stand, whereby two distinct layers are formed, one containing the solvent and unsulfonated portion, and the other containing the sulfonated portion having an SO_3 content varying from more than 10% to 16% or more.

Aqueous solutions of sulfonated products of high SO_3 content, more particularly those produced by the process disclosed in the copending application cited supra, have been found to be admirably suited for softening or attacking water-sensitive adhesives of the type normally employed for gummed labels, stamps, envelope flaps, wallpapers, etc. The use of highly sulfonated oleic acid for the purposes of this invention is preferred. The concentration of the solution may be varied to suit the conditions at hand. The sheets or films to be treated must be somewhat hydrophilic or pervious in nature to permit the solution to penetrate the same in order to attack the adhesive. Such sheets or films would include fibrous materials such as paper, felts, or non-fibrous materials such as Cellophane and like materials weather-sized and/or coated to render them moisture or water-resistant. Excellent results have been obtained by employing solutions containing from $\frac{1}{2}\%$ to 10% or more of the highly sulfonated product. Where the sheets to be separated or removed are highly sized or coated, the quantity of the sulfonated product should be increased accordingly.

It is to be understood that additional agents may be admixed with the aqueous solution of the highly sulfonated product to further enhance the value of the same. Inorganic alkali salts of phosphates or silicates as sodium hexameta-phosphate, tetrphosphate, or sodium silicate are advantageous in some cases. Salts of the lower organic acids as sodium tartrate or potassium citrate may also be added.

As hereinbefore stated, the composition of the invention is particularly adapted for the removal of wallpaper from walls in view of the following reasons:

1. It is highly efficient as it rapidly penetrates through ordinary as well as washable and lacquered wallpapers.

2. It is easy to use as the highly sulfonated product quickly dissolves in tap water regardless of its hardness and without heating.

3. It provides a great time saver for paper-hangers and painters.

4. It is harmless as it will not injure the hands nor deleteriously affect woodwork or varnished surfaces.

5. It is economical as only a small amount is necessary.

6. It quickly softens or dissolves the water-sensitive adhesives usually employed in hanging wallpapers.

7. It may be readily applied to the wallpaper by brushing, spraying or in any other convenient manner.

Since certain changes in carrying out the above process and certain modifications in the composition which embody the invention may be without departing from its scope, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language might be said to fall therebetween; and that they are intended to be inclusive in scope and not exclusive, in that if desired other materials may be added to my novel composition of matter herein claimed without departing from the spirit of the invention. Particularly it is to be understood that in said claims, ingredients or components recited in the singular are intended to include compatible mixtures of said ingredients wherever the sense permits.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A process for removing washable and lacquered wallpapers from walls which comprises contacting the wallpaper with an aqueous solution of a highly sulfonated fatty material having an SO_3 content of more than 10%.

2. A process for removing washable and lacquered wallpapers from walls which comprises contacting the wall paper with a $\frac{1}{2}\%$ to 10% solution of a highly sulfonated fatty material having an SO_3 content of more than 10%.

3. A process for removing washable and lacquered wallpapers from walls which comprises contacting the wall paper with a $\frac{1}{2}$ to 10% aqueous solution of a highly sulfonated oleic acid having an SO_3 content of more than 10%.

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