Patented Nov. 22, 1938 2,137,310

# UNITED STATES PATENT OFFICE

2,137,310

## PLIABLE AND SOFT PAPER AND MANUFACTURE THEREOF

Fritz Sommer, Berlin-Charlottenburg, Germany, assignor to the firm: Chemische Fabrik Grunau, Landshoff & Meyer Akt. Ges., Berlin-Grunau, Germany, a company of Germany

No Drawing. Application March 18, 1936, Serial No. 69,531. In Germany March 27, 1935

8 Claims. (Cl. 92—21)

The new invention comprises a method to increase the pliancy and softness of paper, paper-cloths and paper-tissues and refers also to paper, paper-cloths and paper-tissues with an increased pliancy and softness.

It is known that paper is a material with little pliancy and softness. This is very disadvantageous for many a purpose. This applies particularly to the cases, when paper or materials manufactured of paper are intended to come in contact with the human body. There may be mentioned paper baby napkins, towels and bandages for hygienic or surgical purposes, which contain paper and/or cellulose wool, paper handkerchiefs, toilet paper and other similar products. In all these cases it is important to give to the paper the greatest pliancy and softness possible, in order to avoid a soreness of the skin to be caused by the friction of the paper.

According to the present invention, the softness and pliancy of paper, paper-cloths and paper-tissues is increased by the incorporation of water soluble salts of condensation products of proteins or higher molecular protein cleavage products of the type of lysalbinic acid and soap-forming acids selected from the group containing higher fatty acids and resin acids into the paper pulp. A method for the production of the condensation products is disclosed in my prior U. S. Patent 2,015,912 issued Oct. 1, 1935. The condensation products of proteins or high molecular protein cleavage products and higher fatty or resin acids are usually applied in the form of an aqueous solution of their alkali salts. Instead of the alkali salts of the condensation products of proteins or high molecular protein cleavage products and higher fatty or resin acids, there can be added the salts of such condensation products with organic bases, when it is desired to avoid the addition of alkali compounds to paper, paper-cloths or paper-tissues. Such organic bases only are to be taken into account as have no irritating action on the human skin. The salts of condensation products of proteins or high molecular protein cleavage products and higher fatty or resin acids with mono-, di- and tri-ethanolamin are particularly suitable for this purpose.

The additions to paper, paper-cloths or paper-tissues according to the invention both increase the pliancy and the softness of the paper, and also increase its absorptive power for aqueous liquids which for instance is particularly advantageous with paper baby napkins.

It had already been previously suggested to render paper more pliable and softer by the addition of hygroscopic compounds such as glycol derivatives. Such papers feel moist and heavy and therefore are not suitable for products which are intended to get in contact with the human body. But the paper cloths and paper-tissues containing the additions according to the invention are distinguished by their special softness, pliancy and absorbing power.

The importance of the softness and pliancy of paper products may be demonstrated as follows:

Paper handkerchiefs are mainly used in case of a heavy nasal catarrh causing an excessive consumption of handkerchiefs. The inflamed nose is particularly sensitive and it is considered very advantageously when the paper of the paper handkerchiefs is very soft and pliable.

This similarly applies for instance to paper baby napkins, since the skin of the baby is particularly sensitive.

For paper tissues also the softness and pliancy of the paper is of great importance. This applies both to tissues consisting of paper only and to the so-called mixed tissues which contain textile fibres in addition to the paper.

The required quantity of the additions of condensation products of proteins or high molecular protein cleavage products and higher fatty or resin acids varies according to the degree of softness and pliancy of the paper which is desired. As a rule, 0.1 to 0.5% of condensation products of proteins or high molecular protein cleavage products and higher fatty or resin acids will be added to the paper pulp before the working.

The following examples may serve to illustrate the invention:

*Example 1*

0.5% sodium oleyl-lysalbinate—referred to the weight of the air-dried fibre—are added to the paper pulp in the hollander in form of a 5% aqueous solution and thoroughly mixed. The resulting paper pulp is finished in the usual way.

*Example 2*

When the tri-ethanolamin oleyl-lysalbinate is used instead of the sodium oleyl-lysalbinate which was mentioned in Example 1, there are sufficient 0.3%, which are also applied as a 5% aqueous solution.

The additions to paper, paper-cloths and paper-tissues according to the invention have no irritating action on the human skin, so that the paper products which contain these additions are particularly suitable for hygienic and medical purposes.

I claim:

1. A method of increasing the pliancy and softness of paper, paper-cloths and paper-tissues, comprising the steps of preparing a paper pulp and adding thereto water soluble salts of condensation products of lysalbinic acid with soap-forming acid selected from the group containing higher fatty acids and resin acids.

2. A method of increasing the pliancy and softness of paper, paper-cloths and paper-tissues, comprising the steps of preparing a paper pulp and adding thereto water soluble alkali salts of condensation products of lysalbinic acid with higher fatty acids.

3. A method of increasing the pliancy and softness of paper, paper-cloths and paper-tissues, comprising the steps of preparing a paper pulp and adding thereto water soluble alkali salts of condensation products of lysalbinic acid with resin acids.

4. A method of increasing the pliancy and softness of paper, paper-cloths and paper-tissues, comprising the steps of preparing a paper pulp and adding thereto water soluble salts of condensation products of lysalbinic acid with higher fatty acids, said salts being formed with tri-ethanolamine.

5. Soft and pliable papers, paper-cloths and paper-tissues containing water soluble salts of condensation products of lysalbinic acid with soap-forming acid selected from the group containing higher fatty acids and resin acids.

6. Soft and pliable papers, paper-cloths and paper-tissues containing water soluble alkali salts of condensation products of lysalbinic acid with higher fatty acids.

7. Soft and pliable papers, paper-cloths and paper-tissues containing water soluble alkali salts of condensation products of lysalbinic acid with resin acids.

8. Soft and pliable papers, paper-cloths and paper-tissues containing water soluble salts of condensation products of lysalbinic acid with higher fatty acids, said salts being formed with tri-ethanolamine.

FRITZ SOMMER.