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UNITED STATES PATENT OFFICE.

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METHOD OF TREATING CELLULOSE PULP TO REMOVE ODORS THEREFROM.

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To all whom it may concern:

Be it known that I, GEORGE A. RICHTER, a citizen of the United States, residing at Berlin, in the county of Coos and State of New Hampshire, have invented new and useful Improvements in Methods of Treating Cellulose Pulp to Remove Odors Therefrom, of which the following is a specification.

The object of the present invention is to remove from "sulphate pulp" so-called those substances or compounds which cause a disagreeable odor.

It is now known that an absorbent paper towel may be made from sulphate pulp, i. e. pulp produced by that process of digestion in which the cooking liquor is rich in sodium sulphide. Such towels have the advantage that they are strong, tough and absorbent, and do not easily disintegrate when wet and leave fuzz on the user's skin. One of the greatest objections to the use of such Kraft towels, however, is that, due to the process of digestion, the paper contains certain malodorous compounds, which are not removed during the usual step of washing the newly formed pulp, and which, when the towels become wet in use, produce a marked and disagreeable odor.

I have found that it is possible to remove such malodorous substances by the use of an oxidizing or bleaching agent without decreasing the strength or other desirable characteristics of such towels. For this purpose, I may employ calcium hypochlorite ($Ca(OCl)_2$) or its equivalent, such as ordinarily employed in bleaching sulphite pulp, but in such small proportions as to accomplish the desired purpose without causing any appreciable bleaching action.

Preferably the pulp, prior to its formation into a web or sheet, is subjected to the action of the oxidant, as for example when it is in the beaters in which the pulp is subjected to a greater or lesser degree of hydration.

For example, the washed sulphate pulp is delivered to the beaters with sufficient water to ensure proper circulation of the stock. Then bleach liquor is added to amount to 2% to 10% of 35% bleach based on dry pulp. That is, for 100 pounds of dry pulp is added about 2 to 10 pounds of 35% bleach powder. The roll, lifted from the bed plate, is operated from 30 to 60 minutes to effect the thorough mixture of the beater contents and permit the necessary chemical reactions to occur, after which the roll is lowered and the stock beaten to the desired "slowness" or degree of hydration. This process, however, may be varied by omitting the preliminary mixing and circulation of the stock and starting the beating operation immediately after the addition of the oxidant. Ordinarily the beating operation for the production of towel stock takes from 3 to 6 hours, depending on conditions. In general, I prefer to use 2 pounds of bleach powder for each 100 pounds of pulp, as the calcium compound resulting from the reaction is calcium chloride, which being highly soluble is not retained by the paper formed on the usual Fourdrinier machine. When a greater percentage of calcium hypochlorite is employed,—say upwards of 10% bleach powder for each hundred pounds of pulp,—I prefer to first mix the oxidant with the stock by operating the roll out of contact with the bed plate, and to employ in connection with the beater an ordinary rotary washer to remove the reaction products, prior to the actual beating and hydration of the stock.

The oxidant reacts with the mercaptans or higher sulphides and the sulphur-lignin compounds not removed by the usual washing to which the liberated cellulose fibers are subjected, and frees the pulp from objectionable odors, but does not bleach the pulp, since the color is not changed,—and does not decrease its strength or impair its other desirable qualities, such for example as its absorbing properties.

What I claim is:

1. A process of removing malodors from sulphate pulp which comprises treating such pulp with an oxidizing agent sufficient to react with the malodorous compounds therein contained without materially changing the color of the pulp.

2. A process of removing malodors from sulphate pulp which comprises treating such pulp with an alkaline hypochlorite, there-

by oxidizing the malodorous compounds contained in such pulp without effecting an appreciable bleaching action on the pulp.

3. A process of removing malodors from sulphate pulp which comprises treating such pulp with calcium hypochlorite in the proportion of about 2 to 10 pounds of hypochlorite powder to 100 pounds of pulp, thereby oxidizing the malodorous compounds contained in such pulp.

In testimony whereof I have affixed my signature.

GEORGE A. RICHTER.