# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN PROCESSES OF SOFTENING, DECOLORIZING, AND CLEANSING ANIMAL AND VEGETABLE FIBER.

Specification forming part of Letters Patent No. **187,882**, dated February 27, 1877; application filed September 21, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM MAYNARD, of the city, county, and State of New York, have invented a new and Improved Process of Softening, Decolorizing, and Cleansing Animal and Vegetable Fiber; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to the use of detergents previous to bleaching, by which cotton, silk, wool, and grasses, such as hemp, flax, &c., may be softened, decolorized, and cleansed without boiling.

My process consists in the use of sulphurous acid hydrated—*i. e.*, dissolved in water—in connection with various proportions of an alkali, but principally sal-soda.

In referring to the processes having a resemblance to mine, I would state that it is not new to deterge or cleanse the fiber by first steeping it in a weak acid, and afterward in an alkaline solution preparatory to bleaching the same by chlorine, and that it is also old in bleaching operations to employ the hyposulphite of soda or other alkali, together with a subsequent treatment by an acid, to decompose the salt and liberate the sulphurous acid in the fibers of the cloth to be bleached. I therefore lay no broad claim to these re-agents, nor to the process referred to.

My invention consists for softening, deterging, and decolorizing the fiber; in using the hydrated sulphurous acid mixed and neutralized with a solution of an alkali in its crude state, instead of using the crystallized sulphite salt, whereby I not only avoid the expense of crystallizing the sulphite salt, but I also secure the best bleaching effect of the compound, because of its fresh and newly-formed character, the same being pure and unoxidized, and its bleaching properties being consequently in their greatest degree of potency, in contradistinction to the impure character of the crystallized commercial sulphite salt, which, in its tendency to oxidize into the sulphate, is difficult to keep, and soon depreciates in value as a bleaching-agent.

The application of this process I have found to be the only method of thoroughly cleansing, deoxidizing, and decolorizing fiber without boiling.

In carrying out my invention, I take a quantity of the liquid solution of the sulphurous acid, (*i. e.*, sulphurous acid hydrated,) and add to the same the requisite solution of the alkali until the sulphurous-acid solution ceases to give up its fumes of sulphurous-acid gas. This change being noted, the quantity of alkali required to neutralize the sulphurous-acid solution may be readily determined by inexperienced workmen.

In neutralizing the sulphurous acid I employ magnesia for silk, sal-soda for cotton, and potash or soda for hemp, jute, and flax, as these re-agents are best adapted to the special requirements of the several fibers.

The fabric or fiber is steeped in the mixed solution for from one-half hour to an hour, after which it is taken out, rinsed, and subjected to the ordinary processes of bleaching by sulphur or chlorine, as the case may require.

My process of deterging and decolorizing is effected without the mechanical effect of boiling, thereby saving the expense of steam, and in less than one-fourth part of the time now employed, and with less than half the labor.

The neutralization of the sulphurous acid by the alkali, it will be seen, is also effected—not by combining them in crystalline compounds of hyposulphite of soda—but by combining the crude alkali with the liquid hydrated acid, cheaply manufactured by my patented apparatus, thus saving the expense of crystallization, which is ordinarily effected by boiling the alkali with sulphur, and evaporating.

This neutralization of the two re-agents, also, according to my process, not only prevents the injurious caustic action of the stronger or weaker alkali, but it effects the cleansing and decolorizing of the fiber under the most favorable conditions, for the compound which is formed by the sulphurous acid and alkali is in a peculiar condition,

which experiment has demonstrated to be best adapted to the uses to which my invention is applied.

Having thus described my invention, what I claim as new is—

The herein-described process of cleansing, softening, and decolorizing vegetable and animal fiber, by subjecting them to the action of hydrated sulphurous acid, and a solution of an alkali mixed in neutralizing proportions, substantially as and for the purpose described.

The above specification of my invention signed by me this 20th day of September, 1876.

WM. MAYNARD.

Witnesses:
EDWD. W. BYRN,
SOLON C. KEMON.