

UNITED STATES PATENT OFFICE.

AUGUST ALFRED VOGELSANG, OF DRESDEN, GERMANY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BRITISH HOSIERY AND ELECTROLYTIC BLEACHING COMPANY, LIMITED, OF LONDON, ENGLAND.

ELECTROLYTIC BLEACHING OF COTTON.

No. 867,452.

Specification of Letters Patent.

Patented Oct. 1, 1907.

Original application filed September 21, 1901, Serial No. 76,103. Divided and this application filed July 28, 1902.
Serial No. 117,392.

To all whom it may concern:

Be it known that AUGUST ALFRED VOGELSANG, a subject of the Emperor of Germany, residing at 54¹ Rosenstrasse, Dresden, in the Empire of Germany, chemical engineer, has invented certain new and useful Improvements in the Electrolytic Bleaching of Cotton, of which the following is a specification.

This invention relates to improvements in the electrolytic bleaching of cotton and other textile materials. It has reference more particularly to the bleaching of cotton yarn in bulk, that is without the bundles having to be unpacked, and is also applicable to the bleaching of cops and pirns.

According to the invention the material is first treated with a solution of caustic soda, then with one of bleaching liquor, and finally with a weak solution of sulfuric acid, the composition of these solutions and their mode of application being hereinafter described.

The mode of proceeding when carrying out the bleaching is as follows:—A solution of common salt (NaCl) is allowed to flow through a suitable electrolyzer, (such for instance as described in the specification of my application Serial No. 76,103 of which this application is a division), whereby on well known principles it becomes charged with bleaching agents and forms the bleaching liquor. A convenient mode of estimating the proper working of the electrolyzer is by the difference in temperature of the inflowing and outflowing solutions, a rise of 12° to 18° C. being an indication that the proper strength is being attained. The bleach liquor is then allowed to flow into a receiving tank whence it is drawn into a measuring tank ready for use. The material to be treated is meanwhile packed into the vat in which it is to be bleached, the bundles, in the case of yarn, being placed on end so that the solutions will flow up or down through them more easily. The caustic solution is then run into the tank and is caused to circulate therein. The caustic removes any greasy and other matters that might interfere with the action of the bleach solution. While the caustic is acting the vat is kept tightly covered and after the liquor has been raised nearly to the boiling point by the injector, the cover is removed and the external circulation by the pump from the bottom of the vat back into the top of the same is started. After a suitable time the caustic is run off and clean water is admitted so as to rinse the material. When the caustic residues are thoroughly removed, the bleach liquor is pumped in from the measuring tank and is allowed to act for a

suitable time, being circulated by the pump. It is then run off and the material is again rinsed. The solution of sulfuric acid is next admitted and serves to scour the material, after which the latter is finally rinsed and is removed from the vat. It may then be treated in a rinsing machine and dried, first say by centrifugal driers or wringers and then in a drying room.

The invention is applicable to the bleaching of curtains and piece goods, as well as to various other goods. In dealing with such goods as curtains, a convenient way is to provide a system of rollers so arranged that the articles can be wound backwards and forwards and be caused at the same time to pass through the vats in order to be acted on by the various solutions. It is to be particularly noticed however that in dealing with yarn, the same does not require to be handled in any way during treatment, but is simply packed in the vats in the bundles in which it comes from the mills and is left absolutely *in situ* the whole time, until it is ready to be removed from the vats to be dried. This is a great practical advantage of the system.

The solutions employed may be of the following strengths:—For treating say a thousand pounds of cotton yarn, the salt solution may be formed by dissolving 400 kilogs. of salt in 10 cubic meters of water; the sulfuric acid solution by adding 20 pounds of commercial acid (at 66° Baumé) to 600 liters or say $\frac{3}{4}$ cubic meters of water; while the caustic soda solution consists of 20 to 30 pounds of NaHO dissolved in about 2.5 cubic meters of water, and it is heated to about 50° before it is used. Obviously these proportions may be varied somewhat according to the material under treatment, and according to the results obtained in the experimental vat. It is desirable also that the material should not be subjected to the action of the liquors longer than may be necessary, especially when dealing with loose fluffy yarn.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In the electrolytic bleaching of textile material in bulk, the process which consists in placing the whole of the material in a vat at one time, treating it with caustic solution, collecting from an electrolyzer bleaching liquor in a separate vessel in sufficient quantity to cover the whole bulk of the material and in sufficient strength to bleach it without further electrolytic treatment, admitting the collected liquor into the vat after the withdrawal of the caustic liquor, allowing the bleaching liquor to act *in situ* on the material continuously until said liquor is exhausted, substantially as described.

2. In the electrolytic bleaching of textile material in

bulk, the process which consists in placing the whole of the material in a vat at one time, treating it with caustic solution, connecting from an electrolyzer bleaching liquor in a separate vessel in sufficient quantity to cover the whole
5 bulk of the material and in sufficient strength to bleach it without further electrolytic treatment, admitting the collected liquor into the vat after the withdrawal of the caustic liquor, allowing the bleaching liquor to act *in situ* on the material continuously until said liquor is exhausted,
10 then running off such exhausted bleach liquor, and finally

treating the material with a single quantity of weak acid liquor, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses this 10th day of July 1902.

AUGUST ALFRED VOGELSANG.

Witnesses:

FRIEDRICH MANN,
EMIL DÖLLEHNER.