

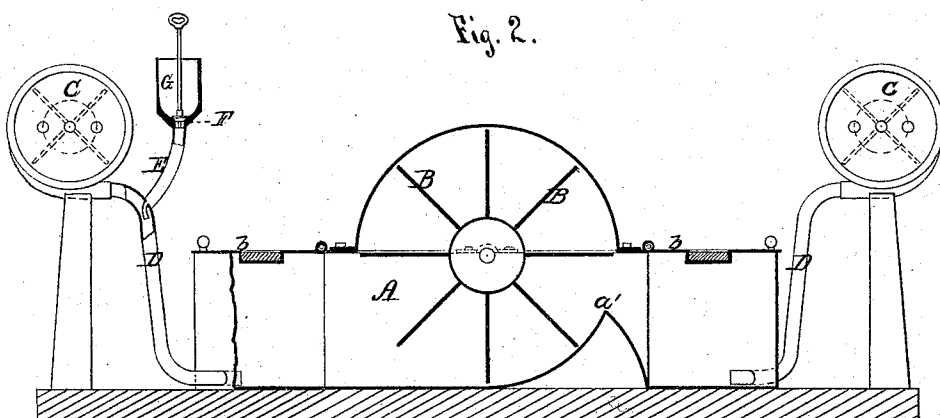
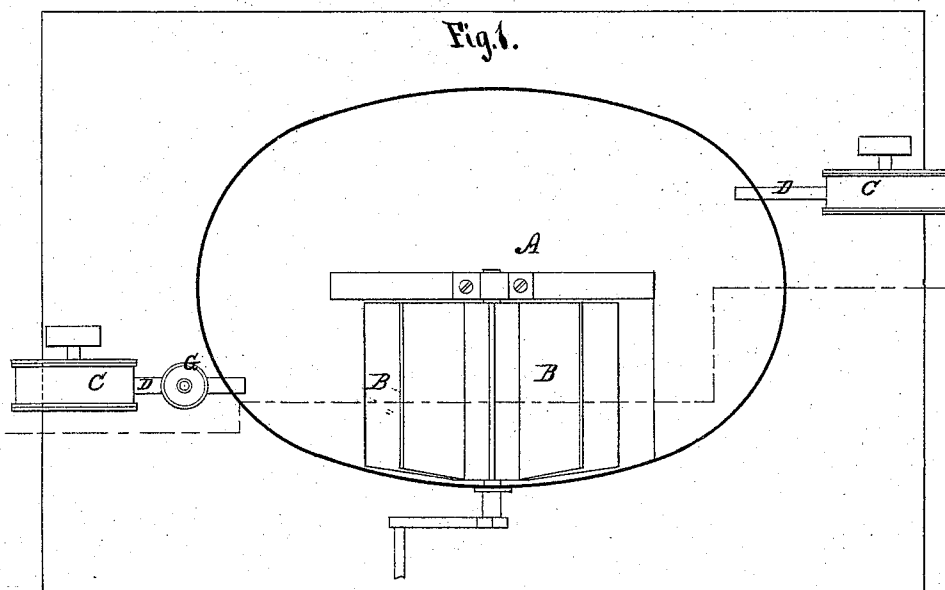
JOHN CAMPBELL.

## Improvement in Process for Bleaching Paper Pulp:

No. 125,658.

Patented April 16, 1872.

*Refers also to bleaching yarns and woven, knitted or felted fabrics.*



Witnesses.

Edward Glaser  
John Tyler

Inventor.

John Campbell  
by his atty. Wm. C. Sullivan

*(over)*

# UNITED STATES PATENT OFFICE.

JOHN CAMPBELL, OF CHATHAM VILLAGE, NEW YORK.

## IMPROVEMENT IN PROCESSES FOR BLEACHING PAPER PULP.

Specification forming part of Letters Patent No. 125,658, dated April 16, 1872.

Specification describing certain Improvements in the Process of Bleaching Paper or Pulp and other fibrous materials, invented by JOHN CAMPBELL, of Chatham Village, Columbia county, State of New York.

My said invention relates to an improvement in the process described in Letters Patent granted to me and bearing date the 20th day of June, 1871.

An apparatus suitable for working my said improved process is represented by the accompanying drawing, in which Figure 1 is a plan; and Fig. 2, a longitudinal vertical section.

In the said drawing A represents an ordinary beating-engine, such as used for the preparation of pulp, with rotating beaters, B, and back fall *a'*. The vat of the engine is to be provided with hinged covers, *b*, and a pipe for carrying off the gases from the engine, and leading them into a chamber, to be utilized in the bleaching of yarns, fabrics, &c. There is a rotary or other suitable blower, C, for forcing a current of air through a pipe, D, into the engine and near the bottom thereof. I prefer to locate this pipe so as to discharge the current of air in the direction in which the pulp is caused to travel in the vat of the engine; and there may be two such blowers, one at each end. The chemicals to be hereinafter described are put into a vessel, G, which communicates, by a vertical pipe, E, with the blast-pipe D, from the blower. The pipe E is provided with a stopper, F, or other equivalent stopper, valve, or cock. The delivery end of the pipe E extends into the pipe D, and for a short distance within it and of less diameter, and concentric with the pipe D, so that the blast of air may pass around the inner pipe E. The delivery end of this pipe E should be above the level of the pulp in the engine.

The pulp or other fibrous matter to be bleached is put into the engine with a weak solution of chlorine liquor of one-eighth of a degree Baumé, or upward, depending upon the material to be bleached, as some fibrous substances require a greater strength than half a degree. This charge I prefer to work in the

engine from ten to twenty minutes before applying the blast of air with other chemicals. The other chemical agents are charged into the vessel G, as follows: For the bleaching of six hundred pounds of pulp made from wood, I take about three pounds of oxalic acid dissolved in about six gallons of hot water. To this solution I add four pounds of porous alumina, freed from iron, previously dissolved in three gallons of hot water; and I then add half an ounce of bromine previously combined with half a gallon of chlorine liquor, such as put into the engine with the pulp.

After the above compound has been charged into the vessel G the blower is started, and then the stopper F is opened to permit the liquor to flow into the blast-pipe D, where it is acted upon by the current of air, which vaporizes it, and the air so charged is forced into the engine, and the blast continued for about half an hour. The blast is then stopped, the cover of the engine removed, and the engine continued in operation until the bleaching is completed.

The aperture in the bottom of the vessel G, leading into the pipe, should be small, so that the charge will take about fifteen minutes to pass through.

I have above described what I deem the best ingredients and proportions thereof, and mode of treatment for bleaching six hundred pounds of pulp made from wood; but I do not wish to be understood as limiting my claim of invention to specific ingredients and proportions, as other equivalent acids may be substituted, and for some kinds of fibrous substances, such as cotton-waste, flax-waste, or colored rags, sulphuric acid would be preferable to oxalic, and so with hydrochloric acid, and so as to the other ingredients.

When applying my said process to the bleaching of yarns and woven, knitted, or felted fabrics, the engine must be adapted thereto by removing the back fall *a'*, and beaters B, and substituting any suitable agitator.

The gases which escape from the vat of the engine through the escape-pipe are, by the said pipe, delivered into any suitable cham-

ber, and there utilized for bleaching yarns, or fabrics suspended therein.

I have discovered that by the use of bromine, vegetable colors are readily discharged from fibrous substances.

What I claim as my invention, and desire to secure by Letters Patent, is—  
The process, substantially as herein-above

described, for bleaching fibrous substances by the use of bromine in connection with the other chemical agents specified, or other agents having like properties.

JOHN CAMPBELL.

Witnesses:

A. J. DE LACY,  
WM. SCOTT.