

# UNITED STATES PATENT OFFICE

CHARLES E. RAMUS, OF NEW YORK, AND GEORGE J. GREGERSON, OF  
BROOKLYN, N. Y.

IMPROVEMENT IN PROCESSES OF CONVERTING VEGETABLE FIBER INTO PAPIER-MACHE, &c.

Specification forming part of Letters Patent No. **221,100**, dated October 28, 1879; application filed  
November 22, 1878.

*To all whom it may concern:*

Be it known that we, CHARLES E. RAMUS, of New York, in the county of New York, and GEORGE J. GREGERSON, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Process for Converting Vegetable Fiber into Papier-Maché, and for other purposes; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to converting the fibers of various woods and vegetables into pulp or a kind of papier-maché. Of course other substances may be added to make the true papier-maché, as known in the arts.

Said invention consists in the process hereinafter fully set forth and in the material thereby produced.

In carrying out our process we take a boiler seven feet in diameter by eight feet in height, with a capacity of about two thousand five hundred gallons. This boiler has a false bottom of cast iron, like a grate covered with a sieve, and four inches distant from the true bottom. The steam is carried directly in between these two bottoms.

In the top of the boiler is a large man-hole for filling or emptying the same. First, two thousand five hundred pounds of the raw material are put into this boiler. We then, in another vat, mix one hundred and twenty pounds of caustic soda with eight hundred gallons of water, which makes a solution weighing 3°. (Twaddell No. 1.) To this is added a solution of chloride of lime, made as follows: sixty-six pounds of chloride of lime dissolved in four hundred gallons of water, making a solution to stand 1½°. (Twaddell No. 1.) These two solutions are mixed and then put into the boiler with the raw material. The boiler is then closed and the steam turned on under the false bottom with a pressure of forty-five pounds to the square inch, said pressure to be kept up for five hours. After this the steam is turned off and the stuff

left in the boiler for four hours. The dirty lye is then drawn off through a cock in the bottom of the boiler, and sufficient clear water is injected into the boiler to perfectly wash the material. After being thoroughly washed the resultant fiber is removed from the boiler into a wooden tank of a capacity of two thousand gallons. Over this is poured a solution of sulphuric acid prepared as follows: three hundred pounds commercial sulphuric acid, diluted in one thousand gallons of water, said solution to mark 3°, (Twaddell No. 1,) stirred thoroughly together and left to remain in this state for two hours. The liquid is then drawn off by means of a cock placed near the bottom of said tank, the opening of which is to be covered by a sieve.

Clear water is injected into the tank with which the fiber is thoroughly washed. After which the fiber is removed from the tank ready for market.

We have now fully set forth the process by which we reduce the fibrous woods to pulpy fiber for various uses in the arts analogous to the uses of papier-maché.

The article produced may be subjected to various treatment to adapt it to different uses, and a good quality of paper is capable of being made from it.

We do not confine ourselves to treating any special raw material, though we shall preferably use pine tops, pine leaves, and the like as being most available and having fibers in abundance.

The material produced is a dried fibrous pulp, which is sold to manufacturers of paper and papier-maché articles.

It is obvious that any of the known equivalents of the chemicals mentioned by us may be used without departing from our invention, or any equivalent mechanical apparatus to that mentioned without departing from our invention.

Referring back to the specification we claim—

The process herein described for reducing fibrous woods to pulp or pulpy fiber, which

consists in treating the material with a solution of caustic alkali and chloride of lime, first under steam-pressure and then without pressure, afterward washing it to remove the salts, then treating it with dilute acid to neutralize any traces of alkali, and finally washing it to remove the acid and salts, substantially as specified.

In testimony that we claim the foregoing as our own we have affixed our signatures in the presence of two witnesses.

CHARLES E. RAMUS. [L. S.]

GEORGE J. GREGERSON. [L. S.]

Witnesses:

E. R. JOHNES,

GURTEZ BEMI.