UNITED STATES PATENT OFFICE.

CHAS. HEATON, OF NEW YORK, N. Y.

IMPROVEMENT IN SEPARATING GUMMY AND SILICIOUS MATTERS FROM VEGETABLE FIBERS.

Specification forming part of Letters Patent No. **47,301**, dated April 18, 1865.

To all whom it may concern:

Be it known that I, CHARLES HEATON, of the city, county, and State of New York, have invented a new and Improved Method of Separating Gummy or Silicious Matters from Vegetable and other Fibrous Materials, to be used in the manufacture of textile fabrics, paper-pulp, paper, other articles or fabrics; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to fully understand and use my improvement.

It is well known that fibrous substances—such as cane, straw, bamboo, and hemp or flax—are composed principally of fiber, gum, and silex, and in the manufacture of textile fabrics, paper, &c., from the said substances, it is necessary to separate the fiber or fibers from their surrounding gums and silicious matters before the fibers can be economically used. Various methods are employed for the purpose of separating the fibers from their said surroundings. One method is to blow the said fibrous substances from a gun or cylinder, in which they have been subjected to pressure, into the atmosphere, in order to disintegrate the fibers. Another plan is to place the said fibrous substances in a steam-boiler and submit them to the action of alkaline solutions and great heat, for the purpose of dissolving the gums and silicious matters, and thus separating the fiber. Under the influenec of heat and moisture in boiling, the gums which surround the fiber of such raw fibrous substances—such as cane, straw, hemp, bamboo, or flex—become softened, but do not dissolve. The said gums remain in a pasty state or soft condition attached to the fibers, and resist the dissolving action of the water in which they are boiled, except when caustic alkalies are used, in which case the gums and silex dissolve, and in conjunction with the caustic alkali form a highly-colored liquid, the removal of which from the fibers is very difficult, and prevents the fibers from being easily bleached.

The object of my invention is to separate the gummy, silicious, and other surrounding matters from the said fibers in a simple and expeditious manner, and to employ mechanical means in part for that purpose.

I place the cane, straw, hemp, or bamboo, or other fibrous substance within a tank, which may or may not be steam-tight, and steam the said substances with steam of any pressure until the pores or interstices between the fibres have become open. I then apply to the said substances in any convenient manner a solution of caustic alkali or its equivalent, which, owing to the previous steaming process, quickly and readily finds its way into the said substances, and softens or dissolves the gummy and silicious matters according to the strength of the solution. After this alkaline soaking of the said substances the gummy and silicious matters are in a pasty condition, but they still closely adhere to the fibers. I now pass the cane, straw, hemp, bamboo, flax, or fibrous substances, through a series of rollers, or submit the said substances to some other suitable form of mechanical pressure, gradually compressing the said substances more and more, so as to smash out the said material in a lateral direction, thus separating the fibers one from the other, and causing the gummy matters to run together and partially separate from the fibers. After this crushing or smashing action of the rollers I allow the fibrous mass to dry. The drying process may be quickened by the application of heat in any suitable manner. When the fibrous mass is sufficiently dry for manipulation, the gummy and silicious matters are so far separated from the fibers that they can be shaken or beaten away, and for the purpose of further separating the said matters from the fibres, I now pass the fibrous mass through a "willow" or other equivalent machine, where the mass is shaken, agitated, or beaten. By this action the gummy and silicious matters are separated from the fibers to a great extent and float away in the form of dust, while the fibers take on the appearance of tow or wool, and are now ready for further treatment. If it is required to make the fibers into textile fabrics, they are to be passed through machinery for that purpose. If it is required to make them into paper-pulp, they are to be placed in a boiler and boiled in alkaline solutions; but it will be found that the action of the rollers or other mechanical pressure (after the action of the alkali) has removed the greater part of the gums and silex, and that the fibrous substance is in a much better

and cleaner condition for ultimate treatment, and that its quality is greatly improved by the manipulation described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The application of mechanical pressure, substantially as described, for the purpose of separating gummy or silicious matters from vegetable fibrous materials.

CHARLES HEATON.

Witnesses:
M. M. LIVINGSTON,
J. P. HALL.