

UNITED STATES PATENT OFFICE.

JOHN E. PODMORE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO CONSOLIDATED RAILWAY INDUSTRIAL STRAW PAPER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF SOUTH DAKOTA.

PROCESS OF TREATING VEGETABLE MATTER FOR SEPARATION OF FIBER THEREFROM.

953,287.

Specification of Letters Patent.

Patented Mar. 29, 1910.

No Drawing.

Application filed June 10, 1908. Serial No. 437,658.

To all whom it may concern:

Be it known that I, JOHN E. PODMORE, a citizen of the United States of America, residing in Jersey City, county of Hudson, State of New Jersey, have invented a certain new and useful Process of Treating Vegetable Matter for Separation of Fiber Therefrom, of which the following is a specification.

This invention relates particularly to the treatment of straw such as that of wheat, rye, rice, &c., for the production of pulp to be used either alone or in mixture with other pulps for making paper and for other purposes.

The process is characterized by the employment of what may be termed weak alkaline solution in the presence of steam of high pressure. By the use of steam at high pressure, a weak alkaline solution may be effectively used.

An example of the practice of this process is as follows:—one hundred pounds of straw in its natural condition,—that is, without its being cut up or mangled (although it might, perhaps advantageously, be mangled to some extent) is placed in a digester with a solution of five pounds of caustic soda in water. Preferably this solution is not used in such quantity as to entirely fill the digester and in practice I have used sufficient to fill it to about two-thirds of its capacity. Steam is then admitted at a pressure of one hundred and fifty pounds, which is what I term high pressure. The straw may be subjected to the action of the alkaline solution and steam for a period of about from one to two hours with the effect that the silica of the straw stalks is separated from the fiber. The solution carrying silicate from the straw is then withdrawn or drained from the digester and to the bottom of the digester a suction pump is applied. The pump may be operated by steam at a pressure of about 50 pounds and will produce a vacuum of about 15 pounds, the effect being to eliminate from the mass of fibers of the straw the remainder of the solution. The straw fibers are then preferably at once, placed in a beating and washing machine where they are treated with cold water. The cold water has a beneficial effect on the fibers and acts to bleach them. The fibers are treated in the

beating machine until they are thoroughly cleansed and reduced to suitable length, say one-half inch. This operation may be beneficially continued for a period of about twenty-four hours. During the earlier part of the period, it is preferred to maintain a circulation of the cold water through the machine. The fibers, now reduced to a condition of pulp, may then be dried in any suitable drying machine and the pulp be compressed into cakes or masses for delivery to paper mills. If desired, however, the pulp may be treated by any suitable bleaching process to further whiten the fibers. The alkaline solution may be repeatedly used there being added from time to time, if necessary, small quantities of caustic soda to maintain its initial effectiveness, until finally it becomes too ineffective to properly act upon the straw.

The strength of the alkaline solution may, of course, be varied as may also the steam pressure but the employment of high steam pressure as compared with pressures heretofore used for purposes similar to that herein described not only makes the process very effective but also makes permissible the use of weak alkaline solution. Steam pressures heretofore used for similar purposes have been from seventy to eighty pounds and solutions very much richer in alkali have been requisite.

Practical operation of this process on a substantial scale has produced from straw, pulp that may be properly characterized as of high grade with respect to quality, softness, color and length of fiber,—the pulp being suitable for manufacture of print paper, of all grades, as well as of writing paper and other stationery.

This invention may be practiced by the use of other alkalies acting as the equivalents of the caustic soda herein specifically mentioned.

I claim:—

1. A step in the process of separating fiber from vegetable matter, which consists in subjecting the vegetable matter to the action of weak alkaline solution in the presence of steam of high pressure, and then separating the solution from the straw fibers by suction creating a vacuum.

2. A process of separating fiber from

straw which consists in subjecting the straw to the action of a weak alkaline solution in the presence of steam of high pressure, then withdrawing the solution from the straw
5 and then subjecting the mass of fibers of the straw to the action of suction creating a vacuum for further elimination of the solution.

3. A process of separating fiber from
10 straw which consists in subjecting the straw to the action of a weak alkaline solution in the presence of steam of high pressure, then withdrawing the solution from the straw, then subjecting the mass of fibers of the
15 straw to the action of suction creating a vacuum for further elimination of the solu-

tion, then beating and washing the fibers and then drying them.

4. A process of separating fiber from vegetable matter comprising the treatment 20 of straw by an alkaline solution in the presence of steam, draining the solution from the vegetable fibers and then applying suction creating a vacuum to the mass of vegetable fibers to further eliminate the solution. 25

In testimony whereof, I have hereunto subscribed my name.

JOHN E. PODMORE.

Witnesses:

K. G. LEARD,

M. L. TRAENDLEY.