

UNITED STATES PATENT OFFICE.

THEODORE A. NIXON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN TREATING STRAW TO OBTAIN PAPER-PULP.

Specification forming part of Letters Patent No. 47,217, dated April 11, 1895.

To all whom it may concern:

Be it known that I, THEODORE A. NIXON, of Philadelphia, Pennsylvania, have invented an Improved Mode of Treating Straw to Obtain Paper-Pulp; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists, first, in manufacturing paper-pulp from straw by a process substantially as described hereinafter, whereby the pulp is improved in quality and the expense of the operation greatly lessened; secondly, in subjecting the prepared straw to the action of a hot solution of alkali previous to boiling the same, substantially as described hereinafter, the time required for the operation being thus greatly shortened and the full strength of the alkali for dissolving the gluten, silica, &c., being obtained.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

Into a tub of suitable size is placed a given amount of raw straw, and upon the latter is poured such a quantity of alkaline liquor (prepared as described hereinafter) as may be necessary to cover the whole. The liquor is then heated by means of a coil of steam-pipe in the tub, and is kept at the boiling-point for about six hours, by which time the straw will become soft and pliable. The tub is now filled with water, and a cock at the bottom of the same is opened, so that the liquor may escape, fresh warm water being constantly admitted at the top of the tub, which is thus maintained full, this operation being continued until the straw is thoroughly washed and all loosened portions of gluten, silica, and foreign matter are removed. The warm straw is then thrown into a boiler, and a solution of caustic soda of about 31° alkalimeter and heated to 250° Fahrenheit is then poured over the same. After this the boiler is closed, and steam is introduced and maintained at about sixty pounds pressure until all the remaining gluten and silica are dissolved and the straw is reduced to a pulpy mass. The pulp is then removed from the boiler, and the liquor is withdrawn, to be used in the preparation of the next batch of straw, as above described,

a sufficient quantity of slaked lime being first introduced into the liquor, in order to render the soda, which has become neutral, again caustic.

By preparing the spent liquor from the second operation, as above described, instead of throwing it away, as has hitherto been the practice, the said liquor is rendered available in removing much of the gluten, &c., previous to the introduction of the straw into the boiler. The amount of soda required for the latter operation is therefore much less than would otherwise be needed, and the quality of the pulp is also greatly improved, owing to the removal by washing of so much of the foreign matter.

It is important that previous to the application to the prepared straw of the alkaline solution the latter should be heated to the degree specified, as the time required for the operation is not only thus greatly shortened, but the full strength of the alkali is obtained to dissolve the gluten and silica, whereas if the alkali were introduced cold into the boiler, and then heated, it would be to a considerable extent diluted by the steam, and would not consequently be so efficient in its action.

In the ordinary process it has been usual to introduce the straw, water, and lye into a boiler, and then heat the whole until the gluten and silica are dissolved. By this process, however, the pulp obtained is inferior in quality, and a much greater amount of time is required to complete the operation, while the proportion of soda used is more than twice as great as is required by the above-described process.

I claim as my invention and desire to secure by Letters Patent—

1. Manufacturing paper-pulp from straw by a process substantially as described.
2. Subjecting the prepared straw to the action of a hot solution of alkali prior to boiling the same, substantially as set forth, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THEODORE A. NIXON.

Witnesses:

CHARLES E. FOSTER
JOHN WHITE.