

# United States Patent Office.

CHARLES B. SAWYER, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR, BY  
MESNE ASSIGNMENTS, TO WILLIAM PRATT AND ABBY A. WILLIAMS.

Letters Patent, No. 109,766, dated November 29, 1870.

## IMPROVEMENT IN THE MANUFACTURE OF PAPER-PULP.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, CHARLES B. SAWYER, of Fitchburg, in the county of Worcester and State of Massachusetts, have made certain discoveries and inventions in the Manufacture of Pulp, such as is used in the manufacture of paper, and other articles of like nature for which paper-pulp is ordinarily used; and in order that others may understand the nature of my invention I give the following description of the same.

As no drawings are necessary to illustrate this, I proceed to say that I have discovered from actual experiment that the tops or vines of the common potato, when properly treated, are capable of furnishing a much more tenacious fiber, and a pulp that will make a stronger paper, card, or pasteboard, and at a much cheaper rate than can be made from the pulp of wood, straw, or grass, and such like substances as have hitherto been used for making paper-pulp.

Again, I have found that the addition of the potato itself in small quantities to the vines, while in process of preparation, adds strength to the fiber and increases the solidity and glassiness of surface when used for card or box-boards.

I have found, also, that the addition of one-fourth or one-third of my peculiar pulp to that obtained from wood and other vegetable substances materially increases the strength of these when made into paper and other like articles of manufacture.

The potato-vine contains within itself a glutinous matter not furnished by other vegetable substances which have been before applied to paper-making, and the vine is much more easily reduced to a stringy pulp; that is, the same amount of beating or grinding will reduce it to the consistency necessary for the formation of paper without cutting the fiber short, and improving its strength.

I have found, also, that where my paper has been made into paper there is less sizing required to make a good and merchantable paper than in the use of ordinary stock.

The vines are first cut into convenient lengths by being fed into the ordinary stock-cutting machine, say from two to five inches in length.

They are then rinsed either in warm or cold water to free them from grit or dust, and are then boiled in water from four to six hours, according to the quantity of the pulp to be made; a longer boiling being needful when the pulp is to be made into books or newspapers than for wrapping and box-boards.

The vines are then drained in the tank, and afterward put into the engine for grinding the same, as in the preparation of common paper-stock, and are beaten or ground to the consistency suitable to the production of the kind of paper or other goods into which the pulp is to be manufactured.

For wrapping-paper, such as in ordinary use, for

box-board and such like goods, nothing further is necessary.

Where a tougher paper or stronger board is used, I add to the vines, while being beaten, about one-half bushel of raw potatoes to the ton of vines, the starchy matter of the tuber is eliminated and mixes with the pulp, rendering it stronger.

Where a finer stock is required, as for printing-paper and card-board, I add one or one and a half bushel of potatoes to the ton of vines, not confining myself, however, to these exact quantities, but varying them in accordance with the results which I wish to produce.

When the pulp is to be made into the wrapping-paper or coarse box-boards, bleaching is necessary; but where a whiter product is required, I bleach the pulp in the first period of its preparation.

I have found from experience that the ordinary process of bleaching other stocks does not answer for pulp made from vines, but as my peculiar process of bleaching will form the application for another patent, I do not further allude to it here.

The specimens which accompany this specification are marked as follows:

Specimen A is a piece of the pulp before it is ground fine enough for working into paper.

Specimen B is a piece of wrapping-paper made from this stock without admixture of other stock or of the potato itself.

Specimen C is a piece of pulp ground fine, and which also has been partially blacked. This also is pure vine-pulp.

I am aware that paper-pulp has been made from straw, grass, wood, reeds, and some other vegetable substances, but I know of no vegetable substance which furnishes so strong a fiber in the pulp, and with so little cost either in crude material, or with so little expense in preparation, as the pulp which I make from the potato-vine.

Therefore, while I do not claim broadly the use of raw vegetable material; nor either of them to which I have above alluded,

What I do claim as new, and desire to secure by Letters Patent, is—

1. The vine of the potatoe, for the manufacture of pulp for paper and other like articles, as pasteboard and papier-mache.

2. The tuber itself in combination with the potato-vine, for the making of paper-pulp.

3. Either or both the above-named materials in combination with ordinary paper-stock, or with pulp made of other vegetable materials for the purpose of cheapening and improving the same.

CHARLES B. SAWYER.

Witnesses:

T. A. CURTIS,

CLARENCE BUCKLAND.