

UNITED STATES PATENT OFFICE.

HARRISON B. MEECH, OF FORT EDWARD, NEW YORK.

PROCESS FOR THE REDUCTION OF FIBROUS SUBSTANCES TO A PULP.

Specification forming part of Letters Patent No. 56,971, dated August 7, 1866.

To all whom it may concern:

Be it known that I, HARRISON B. MEECH, of Fort Edward, in the county of Washington and State of New York, have invented a new and useful Improvement in the Reduction of Wood and other Fibrous Substances to a Pulp for the Manufacture of Paper; and I do hereby declare that the following is a full, clear, and exact description of the same.

There are many processes for reducing wood and other fibrous substances to a pulp for the manufacture of white and other kinds of paper which require a very strong alkaline liquor, from 5° to 10° Baumé, with a steam-pressure of from one hundred and fifty to three hundred pounds per square inch within the boiler.

It is well known that many kinds of wood possess a good fiber for paper; but owing to its being compactly united with gummy substances the ordinary method of reducing it to a pulp, by means of strong alkali and high steam-pressure, is expensive.

My process for accomplishing this result consists, first, in converting the wood into thin shavings. I then pack the shavings into a close boiler, either rotary or stationary. I then apply chlorine gas with a hydraulic or pneumatic pressure of thirty pounds or more, by means of a force pump or pumps, upon the shavings within the boiler for from ten to twenty minutes. Then, by means of pipes, I withdraw the said gas from the boiler. After the gas has been withdrawn from the boiler I inject therein, by means of a force-pump, a sufficient quantity of a weak caustic alkaline liquor, (in strength from 1° to 3° Baumé,) to cover the shavings or stock. I either inject the said liquor boiling hot or heat it within the boiler. I then subject this liquor and the stock to a pressure of thirty pounds or more to the square inch within the boiler. For this purpose I may use steam, hydraulic, or pneumatic pressure; but I prefer to use the last named, inasmuch as it requires less time to obtain the required pressure. The stock is now ready to be washed by means well known, after which it may be bleached by means of chlorine gas, under pressure, in a close boiler, or by the ordinary manner well known to paper-makers.

For reducing straw or grass to a pulp by

this process I do not use so strong a caustic solution nor so much gas-pressure as I do for wood, as it does not require so much to separate the fibers from the gluten and silica.

My object in this process is more particularly for the reduction of wood to a pulp for the manufacture of white paper, although I do not confine myself to the reduction of wood alone, for by this process all fibrous substances may be reduced to a pulp with a weaker alkali and a less expense than by the ordinary manner.

I may also use chlorine gas under pressure in a close boiler upon the fibrous substances to be acted upon to reduce them to a pulpy condition for the manufacture of colored paper without bleaching, for water-proof paper, or for Manila paper, and for this purpose I use it as follows: For making water-proof paper stock I use only the chlorine gas with pressure upon the stock in a close boiler without the use of an alkaline liquor, as the action of the chlorine will soften the silica and gluten; after which the stock may be beaten into a pulp by rag-engines in common use for that purpose. By this means the gluten, silica, and the like may be retained in the stock and answer the same purpose as glue or sizing in the manufacture of water-proof paper.

For Manila paper, from straw or grasses, I use, after the action of the chlorine gas, a solution of lime, soda-ash, salt, and water. To one hundred pounds of stock I use about fifty gallons of water, fifteen per cent. of lime, five per cent. of soda-ash, and eight per cent. of salt. This solution I use with pressure in the same way that I use caustic soda, as above described, for the manufacture of white paper.

The advantages which my process possesses over others in use are, that the pulp made by this process produces a superior article of paper, requires a much shorter time, and consumes a much less amount of material in its reduction, thereby causing a material reduction in the price of paper.

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

1. Reducing fibrous substances to a pulp by means of chlorine gas under pressure, in combination with an alkaline solution.

2. The use of chlorine gas under pressure for the purpose of dissolving the glutinous sub-

stances during the first process in the preparation of paper-stock from wood or other fibrous substances.

3. Using chlorine gas under pressure in dissolving silica in fibrous substances, and then converting said substances into pulp, and retaining the silica in the pulp.

4. Reducing fibrous substances to a pulp for

the manufacture of Manila paper by means of chlorine gas under pressure, in combination with the solution herein described.

HARRISON B. MEECH.

Witnesses:

CHAS. HERRON,
D. E. SOMES.