

United States Patent Office.

JEAN BERNARD BIRON, OF CARPENTRAS, FRANCE.

Letters Patent No. 67,941, dated August 20, 1867.

IMPROVEMENT IN DISINTEGRATING AND BLEACHING WOOD AND OTHER MATERIALS TO FORM 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, JEAN BERNARD BIRON, of Carpentras, have invented "a New Bleaching Process especially applicable to Wood Pulp, and also to other Fibrous, Filamentous Materials for the Manufacture of Paper and Pasteboard;" and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to an improved process for bleaching wood pulp, whereby the pulp preserves its strength and flexibility, generally much impaired by the ordinary processes employed, which involve repeated applications of acids, chlorine, and alkalies of considerable strength, impairing the fibre as well as enhancing the cost of the pulp.

My improved method of bleaching obviates both these objections to the existing methods, and is applicable to pulp made from all species of trees having a soft, light fibre, many of which, but for my bleaching process, could not be employed in the manufacture of pulp generally, in consequence of the necessity of employing a high temperature for the disaggregation of the fibres, whereby a tint is imparted to the pulp, increasing the difficulty of the bleaching operation.

My process is as follows: The wood to be converted into pulp is to be split or divided and freed from bark, knots, and core, and reduced to pieces of about two to three inches in each dimension. I prefer then to macerate the wood by steeping it for about a month in a preparation of quick-lime and water, the lime in the proportion of from fifteen to eighteen per cent. by weight of the wood. The immersion should continue until the wood is so saturated that it will sink to the bottom. It is then—or, if desired, without previously undergoing the process of maceration—submitted to the action of a vertical millstone turning in a trough containing the preparation above mentioned. The wood thus crushed and disaggregated is placed in a heap on an inclined surface for the purpose of draining off the lime-water, and after remaining there a few days is carried to a washing-roller, whence it issues partially bleached. The pulp is then placed in a vat and treated with a solution of a sulphuret of an alkali, that which I prefer to employ being the pentasulphuret of potassium, but the pentasulphuret of lime is more commercially advantageous from its comparatively low price. The pulp being well stirred and thoroughly impregnated with this solution, I pour in a solution of sulphuric or muriatic alum or acid sulphate or hydrochlorate of alumina. The sulphuret is now at once decomposed, the acid eliminates the sulphur from its combinations and forms a salt with its alkaline base, and the sulphur combines with the hydrogen of the coloring matter of the wood, forming sulphuretted hydrogen, the presence whereof is ascertained by its characteristic odor.

Although it may be stated generally that sulphuretted hydrogen is evolved when an acid is poured into an alkaline sulphuret, yet in this case I do not doubt that the hydrogen going to form the sulphuretted hydrogen is derived from the coloring matter of the wood, being convinced thereof from the bleaching or discoloration of the fibre which immediately takes place when treated as above described, and the wood pulp may now be associated with rag pulp or employed separately in the manufacture of paper.

The quantities to be employed of the various reagents, sulphate of alumina and acids, above mentioned, will depend on the greater or less degree of coloring of the wood pulp when it issues from the millstone and rollers, and on the degree of whiteness desired to be obtained, and cannot, therefore, be exactly predicated, but approximately the following are the proportions I prefer to employ: For one part, by weight, of sulphuret, five parts of crystallized alum or five parts of hydrochloric acid of twenty-two degrees, or three parts of sulphuric acid of sixty degrees of strength. The same wood is to be treated with four per cent. of pentasulphuret and twenty per cent. of alum or twenty per cent. of hydrochloric acid or twelve per cent. of sulphuric acid, and I then obtain a wood pulp which, mixed with forty to fifty per cent. of rag pulp, will yield a paper sufficiently white for newspapers and printing generally.

The bleaching action produced by the sulphuret on wood pulp will be produced more or less efficiently on any other textile material. On being first treated with this agent, and afterwards submitted to the action of chlorine, they will acquire a notably superior degree of whiteness to that given by chlorine alone.

Another advantage of my process is the preservative effect of the sulphate of alum employed, whereby the wood pulp may be indefinitely stored till wanted for use.

I do not confine myself to the use of wood pulp alone in the manufacture of paper and pasteboard, as any other fibrous filamentous materials may be subjected to the treatment herein described without departing from my invention.

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

The employment, as a bleaching agent, of alkaline sulphurets, in manner and for the purposes substantially as above set forth and described.

J. B. BIRON.

Witnesses:

EMILE ROUX ALLOUD,
O. MUNN.