

UNITED STATES PATENT OFFICE.

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PROCESS FOR THE RECOVERY OF PULP FROM PRINTED WASTE PAPERS.

1,060,158.

Specification of Letters Patent.

Patented Apr. 29, 1913.

No Drawing.

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To all whom it may concern:

Be it known that I, JOHN M. BURBY, a citizen of the United States, and a resident of Astoria, Long Island, county of Queens, and State of New York, have invented certain new and useful Processes for the Recovery of Pulp from Printed Waste Papers, of which the following is a full specification.

My invention relates to manufacture of paper, and consists of the hereinafter described process for the recovery of pulp from printed waste papers, whereby also so-called mechanical wood pulp, that may be contained therein, is recovered without impairing its color, or physical qualities, and in a condition suitable for use in the manufacture of the same grade of paper.

The removing of printers' ink and of other impurities, which is necessary for the recovery of the pulp from printed waste papers, requires the waste papers to be subjected to the action of solvents, preferably alkaline solutions, and on account of the sizing, used in the manufacture of some print papers, particularly of the grades designated as book papers, it is desirable and often necessary, to subject the waste papers to the action of such solvents at high temperatures, to effect the necessary disassociation of the pulp fibers. These so-called printed or book papers, are made partly of mechanical wood pulp (ground raw wood) and if subjected to the action of an alkaline solution, at a higher temperature than set forth in my application for U. S. Letters Patent, filed June 15, 1911, Sr. No. 633,417, or if, as directed in some prior patent, such waste papers are boiled therein, the fibers of the mechanical wood pulp are thereby discolored and otherwise detrimentally affected, and all pulp thus recovered is rendered unfit to be used again for the manufacture of the same grade of paper from which it was recovered, because it is not feasible to separate the discolored fibers of the mechanical wood pulp from the fibers of the sulfite, or of the soda pulp, which are not affected by the alkaline solution.

In my aforesaid application for U. S. Letters Patent, I have set out the condition under which alkaline solutions may be employed in a process for the recovery of all pulp from printed waste papers, and in the course of experiments, conducted with the object in view to discover means for recovering the pulp, also from such print papers as

need to be subjected to a higher temperature, I have ascertained, that a solution made of 2.1 parts of bicarbonate of soda (NaHCO_3), or of 2.5 parts of bicarbonate of potash, (KHCO_3) in one thousand parts of water (measured by weight) is equivalent in its effect upon the oily ingredients of printers' ink to a solution of one part of caustic soda in the same quantity of water, that the bicarbonates of soda, or of potash, possess the additional particular quality, that they may be employed even in a stronger solution than the standard above stated, and that the waste papers may be subjected to the action of such solutions at higher temperatures, in fact, at any temperature below the boiling point of water (212°F.), and will not discolor or otherwise detrimentally affect the fibers of the mechanical wood pulp as may be contained in such printed waste papers. A bicarbonate solution must, however, not be heated to, or above, 212°F. , because thereby the bicarbonate of the alkali would be converted into its carbonate, and the discoloration, and otherwise impairment of the physical qualities of the fibers of the mechanical wood pulp, would result to the same extent as if the printed waste papers had been subjected to the action of a correspondingly strong solution of carbonate of soda, or of potash, under such high temperature.

The process of recovering pulp fibers from printed waste papers is carried on according to my invention as follows: The waste papers are pulped and then charged into tanks filled with a solution of bicarbonate of soda, or of potash, and preferably provided with means for heating the solution, or maintaining it at such a temperature as required to liquefy the sizing. For determining the strength of the solution, also the proportionate quantity of water, contained in the pulped waste papers when charged into the tanks, must be taken in consideration. Where saving of water is of importance, or if there be any difficulty in determining the strength of the solution to be added to the pulped mass in the tanks to obtain a solution of only the requisite strength, the solution of bicarbonate of soda, or of potash, may be employed in the beating engine, but whichever way the solution is used, its quantity should be about fifteen times the dry weight of the waste papers treated, and it should contain about 2.1 pounds of bicar-

bonate of soda, or about 2.5 pounds of bicarbonate of potash, to each one thousand pounds of water. The pulped waste papers are worked in the solution preferably by means of mechanical agitators for from about thirty minutes to one hour, then conveyed over screens, where the alkali solution is drained off, and the pulped waste papers subjected to the action of fresh water to remove the particles of ink, filler, sizing, etc.

The waste papers may be, as recited, subjected to the action of the solution, while they are being pulped; the solution being used in the beaters, and then the treatment in the tanks may be omitted. It is, however, preferable to pulp the waste papers in warm fresh water and then treat the pulped material with the solution in the tanks, as hereinbefore set forth. All pulp recovered by either process will be found to be of the same color and in such physical condition as when ordinarily used. The fibers of the mechanical wood pulp are not disclosed, or in any way impaired, and the fibers of both, the chemical and mechanical pulp, are recovered in a condition suitable to be used again for the manufacture of similar grades of paper without any other or further treatment. The cleaned pulp fibers may be conveyed directly to the paper machine, or drained and stored for future use.

I claim as my invention:

1. The process of recovering pulp from

printed waste papers, consisting of the following steps, (1) subjecting the waste papers to the action of a solution of bicarbonate of soda, or of potash, (2) draining off the solution and (3) removing the impurities by washing the pulped material in fresh water and collecting the clean pulp; substantially as herein set forth.

2. The process of recovering pulp from printed waste papers consisting of the following steps: (1) pulping the waste papers; (2) subjecting the pulped material to the action of a solution of bicarbonate of soda, or of potash, at a temperature below its boiling point, and agitating the pulped material therein; (3) draining off the solution; (4) removing the impurities by washing the pulped material in fresh water, and collecting the clean pulp; substantially as herein set forth.

3. The process of recovering the pulp from printed waste papers consisting of the following steps: (1) pulping the waste papers in a solution of bicarbonate of soda, or of potash; (2) removing the alkali solution and all impurities by washing the pulped material in fresh water; and collecting the clean pulp; substantially as herein set forth.

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Witnesses:

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