

UNITED STATES PATENT OFFICE.

ALBERT E. WOOLF, OF NEW YORK, N. Y.

APPARATUS FOR BLEACHING BY ELECTROLYSIS.

SPECIFICATION forming part of Letters Patent No. 581,052, dated April 20, 1897.

Application filed December 30, 1896. Serial No. 617,478. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. WOOLF, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Apparatus for Bleaching by Electrolysis; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for bleaching textile fabric, thread, wood-pulp, or other material by the electrolysis of a saline solution or a solution of a chlorid salt.

The object of my invention is to provide a convenient and effective combination and arrangement of apparatus for carrying out the bleaching and electrolyzing operations.

The matter constituting my invention will be set forth in the claims.

I will describe the details of construction and arrangement of my apparatus by reference to the accompanying drawing, which represents the apparatus partly in vertical section and partly in elevation.

I provide a suitable tank or vat A, constructed with a vertical shaft D, which is supported at the top by a cross-bar *a* and at the bottom by a block *a'*, having a socket for the lower end of the shaft. To the shaft are secured radial agitating-arms B, which may be perforated, if desired. Near the bottom of tank A is fitted a false perforated bottom or strainer C for supporting the material to be bleached and forming the compartment J. The vertical shaft D has secured to its upper end a beveled spur-wheel *d*, which meshes with a similar beveled wheel *l*, secured upon the horizontal shaft L. The shaft L is supported in journals at the lower ends of the hangers *w*, and has secured to it a belt-wheel *m*, and is provided with a crank *l'* for operating the pump N. An outlet-pipe *b* connects the lower compartment J of tank A with the pump N, and a delivery-pipe *c* connects said pump with the elevated strainer-tank E, which is provided with an inclined perforated strainer *e*. Any suitable strainer may be used in the tank E, which will arrest solid particles in the liquid and permit the clear liquor to pass to the outlet-pipe *e'*.

The electrolyzing-tank F is suitably supported within the liquor-tank H, and has connecting with its bottom at the point *f'* pipe *e'* for conducting strained liquor from the tank E. The electrodes are preferably composed of plates arranged side by side and extending across tank F and are preferably composed of positive electrodes *f*, of platinum or metal of the platinum group, arranged alternately with the negative electrodes *g*, of carbon or other suitable material. The positive and negative electrodes *f* and *g* are respectively connected by conducting-wires 1 and 2 with a dynamo P or other suitable source of electricity. As the liquor becomes suitably electrolyzed it overflows into tank H, from which it is conducted by pipe *h* down into the bleaching-vat A.

A solution of a suitable chlorid salt may first be placed in the tank F and the electric current passed into the electrodes. As the liquor becomes sufficiently electrolyzed to develop the bleaching-gases it overflows into tank H, from which it is discharged into the vat A, and a suitable supply thus accumulated in said vat. The material to be bleached is placed in vat A, and the agitating-arms B rotated. As the bleaching-liquor becomes weakened or exhausted in tank A it is drawn off through the pipe *b* by opening valve *i* by means of a pump N and discharged through pipe *c* into the strainer-tank E, where it is strained to remove objectionable material, and then delivered by pipe *e'* into the electrolyzing-tank F, where it is again electrolyzed to become an active bleaching agent.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for bleaching wood-pulp and other material, the combination with the bleaching-tank having a perforated false bottom or strainer near its bottom and a shaft provided with agitating-arms, of an elevated electrolyzing-tank having positive electrodes of platinum, or a metal of the platinum group, and suitable negative electrodes, both connecting with a source of electricity, an overflow liquor-tank below, and arranged to receive the products from said electrolyzing-tank, a pipe leading from said liquor-tank to the bleaching-tank, a pipe connecting with

the bleaching-tank below its strainer, a pump connecting therewith, and a discharge-pipe entering the electrolyzing-tank at or near its bottom, substantially as described.

- 5 2. In an apparatus for bleaching wood-pulp and other material, the combination with the bleaching-tank, having a strainer and a suitable agitator, of an outlet-pipe connecting with the outlet-compartments of the tank, a
10 pump connecting therewith, a discharge-pipe connecting with the pump and extending above the same, an elevated strainer-tank, as E, having a strainer, as e, with which said discharge-pipe from the pump connects, an
15 electrolyzing-tank on a lower level than said

strainer-tank and containing suitable positive and negative electrodes, a pipe connecting the strainer-tank with the electrolyzing-tank, at or near its bottom, an overflow liquor-tank below and arranged to receive the products 20 from said electrolyzing-tank and a pipe connecting said liquor-tank with the bleaching-tank, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT E. WOOLF.

Witnesses:

E. B. CLARK,

H. M. STERLING.