Patented Jan. 18, 1927. 1,614,916

UNITED STATES PATENT OFFICE.

CAMPBELL C. CARPENTER, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO U. S. LIGHT & HEAT CORPORATION, OF NIAGARA FALLS, NEW YORK, A CORPORATION OF NEW YORK.

TREATMENT OF WOOD SEPARATORS.

No Drawing. Application filed June 21, 1923. Serial No. 646,987.

This invention relates to the treatment of wood separators for storage batteries.

An object of the invention is to so treat a wood separator as to get the fibres of the wood in proper colloidal condition so as to more readily absorb and transfer sulphuric acid and so as to more readily diffuse battery acid.

A further object is to so prepare the separator that it will not be readily attacked by battery electrolyte, thereby increasing the separator life.

When the wood of the separator is in proper colloidal condition it has the property of absorbing acid of greater density than that of the electrolyte surrounding it. This increases the conductivity of the separator.

In the process as outlined below, exact proportions and periods of time have been given as representing the best practice so far determined, but it is not intended that the stated proportions and time periods shall be construed as otherwise than illustrating the principles of the process, it being understood that variations in proportions and details of treatment may be resorted to without departing from the principles of the invention as defined in the appended claims.

In the specific process described, Port Orford cedar has been selected as a wood to be treated, as this has been found specially adapted for use as a separator. The process is, however, equally adapted for use with other woods.

In carrying out the process, dry separators, cut to proper size, are placed together, preferably on edge, in a tank, covered with water and boiled for a period of approximately one hour. The separators are then placed in a solution of caustic soda which should be of a strength of 18% solution or over, say of 1.275 specific gravity, in which the separators remain for a period of one hour or more. Separators are then removed from this solution and acidulated with sulphuric acid and thoroughly washed in water. They are then ready for service.

It has been found that separators treated in this manner are characterized by an excessive shrinkage of the wood fibre in the direction of the fibre length and remain practically unchanged in the other direction of the wood. This is to be distinguished from treatments which have been proposd heretofore, using a low concentration of caustic in which the separator is characterized by a swelling of the fibres in the direction of their diameter, while remaining practically unchanged in length. This difference in characteristics is apparently due to the fact that the high concentration of caustic will not attack the lignocellulose. It has also been found that this high concentration of caustic does not break up the lignocellulose constituents and therefore does not free certain deleterious substances which are freed by treatment with weaker caustic solution. The acidulation step is desirable as assisting to prevent attack and breaking up of the lignocellulose, for it is obvious that if the separator were treated with a strong caustic, without subsequent acidulation, the caustic would be diluted in the washing step, passing through the lower concentration, therefore attacking the lignocellulose and freeing the deleterious substances. This theory is substantiated by the observation that in the treatment with the concentrated causic there is practically no discoloration of the treating liquid, whereas by treatment with the dilute caustic, the treating liquid is very much discolored.

The initial treatment with water is to produce an initial swelling of the fibres.

What I claim as new and desire to secure by Letters Patent of the United States is—

1. The process of treating wood for use as battery separators which comprises treating the wood with a concentrated caustic solution and controlling the process to prevent pulping the wood.

2. The process of preparing wood for use in battery separators which comprises treating the wood with concentrated caustic solution and controlling the process to prevent pulping the wood, then acidulating and washing out the treating solution.

3. The process of preparing wood for use in battery separators which comprises treating the wood with a solution of caustic of not less than 18% concentration and controlling the process to prevent pulping the wood, thereafter acidulating and washing out the treating solution.

4. The process of preparing wood for use in battery separators which consists in treating the wood with a solution of caustic of not less than 18% strength and controlling the process to prevent pulping the wood,

thereafter acidulating with sulphuric acid and washing out the treating liquor.

5. The process of preparing wood for use in battery separators which comprises boiling the wood in water, thereafter treating with caustic solution of approximately 1.275 specific gravity, thereafter acidulating, and thereafter washing in water.

6. A battery separator comprising wood treated with concentrated caustic solution, characterized by the fact that the wood fibres have been excessively shrunk in a direction of length without appreciable change in fibre dimensions in other directions.

In witness whereof, I have hereunto subscribed my name.

CAMPBELL C. CARPENTER.