

For this purpose it passes up through the open tube to the top of the boiler, where there is a condensation and the water passes back through the fibre to the bottom of the boiler, removing in its passage the soda and dissolved intercellular matter from the fibre. This can be continued until all the soda is removed, but it would undoubtedly be more economical to stop the boiling before the complete removal of the soda, and finishing the washing outside of the boiler in the usual way. The weak soda solutions thus produced could be returned to the bottom of the boiler in a subsequent charge. By this method of operating the soda is obtained in a concentrated solution with but slight mechanical losses.

The advantages of this proceeding are these: The wood can be disintegrated with a minimum amount of soda and the soda obtained at the end of the operation in a concentrated solution. The steam treatment not only removes the soda solution from the fibre, but the completion of the process takes place under comparatively mild conditions, favorable to saving cellulose from being dissolved. The boiler can be heated by a direct fire at a considerable saving.

The operation as I have above described it forms a complete process, but I think that it would be cheaper to subject the shavings to a preliminary treatment to remove a large part of the intercellular matter as follows: I mix the

shavings and sawdust with three or four times their weight of the soda liquors from the closed boiler and heat the mixture in an open boiler. I have found by actual trial that such a mixture can be heated several hours above the boiling point of water, and yet retain a large part of the water, and that about half of the intercellular matter is thereby rendered soluble. On the large scale I would proceed as follows: I would have a large upright boiler, open at the top and arranged at the bottom somewhat like an iron ore roaster (I am familiar with ore roasting), and provided with steam coils or jackets for heating. I would charge the mixture of shavings and soda liquor into this open boiler, and heat it at the bottom. With a moderate height of boiler I am sure the bottom could be heated to 230° to 240° F. The water that is given off as steam at the bottom is condensed in the cooler part of the charge. When the charge at the bottom is sufficiently cooked it is withdrawn and fresh mixture added at the open top, and these operations are repeated. This process is then carried on as a continuous operation. The product of this process is to be put into a press and a limited amount of water added. On applying pressure nearly all the soda is removed in the form of a concentrated solution, which can be evaporated for the recovery of the soda. Or it may be put into a centrifugal machine and slightly washed. The material is

then put into the closed boiler and subjected to the operation.

All the points in the complete process as I have described it, except the circulation of the liquid in the enclosed boiler, have been demonstrated in my laboratory in a small way, and I know that they are operative. I can, if you wish, give a mass of details of these tests, for I keep full records of such work, but perhaps it will be sufficient at present to say that they show that the strength and amount of soda solution required are both low, and that the yield of fibre would be comparatively high.

Of course, planer shavings and sawdust, being waste products, are much cheaper than pulp wood. Nearly all my experimental work has been upon white pine shavings and sawdust. A further advantage is the fact that they are produced in abundance at and near many cities where there are local paper mills which could use the fibre produced to good advantage.

While I have described this process as applied to sawdust and shavings, I think that the principles of the closed boiler cooking could be applied with profit in the ordinary process of boiling wood chips in soda solution. I have tried to set this matter before you clearly and concisely, but if I have not done so I would be glad to make any additions or to answer any questions that I can."

TOWER & WALLACE

ASHLEY H. TOWER, M. Am. Soc. C.E.
CONSULTING ENGINEER.

Broadway and 26th St. - NEW YORK

E. BRADLEY, C.E. - 3 Place d'Armes Hill, MONTREAL - Canadian Representative.

ARCHITECTS AND ENGINEERS

PAPER AND PULP MILLS
MANUFACTURING AND
POWER DEVELOPMENTS

Felts for Pulp Mills.
Felts and Jackets for Paper Mills.
Felts for Fast Running on News.
Felts of any width up to 120 in.
Felts for Tissue Papers.
Felts for Boards and Roofing.

Try our Special HARPER FELTS

Every Felt Guaranteed.

HAMELIN & AYERS
LACHUTE MILLS, P.Q.

BOYNTON & COMPANY

MANUFACTURERS OF

EMBOSSED AND TURNED MOULDINGS,
WOOD GRILLES,

SEND FOR

CATALOGUE

AND AUTOMATIC TURNINGS

47 W. Washington St., - CHICAGO, ILL.

ESTABLISHED 1819.
CHARLES F. CLARK, President.
JARED CHITTENDEN, Treasurer.

BRADSTREET'S

Capital and Surplus, \$1,500,000.

Officers Throughout the Civilized World

Executive Offices:

Nos. 346 and 348 Broadway, New York City, U.S.A.

THE BRADSTREET COMPANY gathers information that reflects the financial condition and the controlling circumstances of every seeker of mercantile credit. Its business may be defined as of the merchant, by the merchant for the merchant. In procuring, verifying and promulgating information, no effort is spared, and no reasonable expense considered too great, that the results may justify its claim as an authority on all matters affecting commercial affairs and mercantile credit. Its offices and connections have been steadily extended, and it furnishes information concerning mercantile persons throughout the civilized world.

Subscriptions are based on the service furnished, and are available only by reputable wholesale, jobbing and manufacturing concerns, and by responsible and worthy financial, fiduciary and business corporations. Specific terms may be obtained by addressing the company at any of its offices. Correspondence invited.

THE BRADSTREET COMPANY

Toronto Office: Cor. Jordan and Melinda Streets.
THOS. C. IRVING, Sup't.

CAMP SUPPLIES

Send for a Sample of fine make and draw JAPAN TEA, at 13½ cents. Just the thing for the Camps.

H. P. Eckardt & Co.

WHOLESALE GROCERS

Cor. Front and Scott, TORONTO

PULP AND PAPER MILL MACHINERY.

CONTRACTORS FOR COMPLETE EQUIPMENT OF

GROUND WOOD, SODA
or SULPHITE PULP MILLS.

We invite correspondence from those requiring anything of this nature. We build a full line of

Barkers, Chippers, Tanks,

Digesters, Pumps,

Jewell Filters, Conveying

Machinery, Wet Presses,

Screens, Screen Plates,

Etc., Etc.

OUR CROCKER TURBINE PLANTS are driving some of the best mills in the Dominion.

Write for Circulars and Prices.



THE PORT HENRY PULP GRINDER.

With latest improvements; patented 1898.

Operation continuous and production large.

Most convenient in handling and thoroughly well built.

Ask for special bulletin No. 505.

Branch Offices:

MONTREAL, TORONTO, RAT PORTAGE, ONT.
ROSSLAND, B.C.

Head Office and Works:

36 to 40 LANSLOWNE ST.

SHERBROOKE, QUE.



Lumberman's Inspection Book

Send four 3-cent Canadian postage stamps for a copy of the LUMBERMAN'S VEST-POCKET INSPECTION BOOK, containing rules for the inspection of Pine and Hardwood Lumber in the Leading Markets of the United States and Canada.

Address: The CANADA LUMBERMAN, Toronto, Ont.