

# UNITED STATES PATENT OFFICE.

LUDWIG HERZ, OF NUREMBERG, GERMANY, ASSIGNOR TO THE FIRM OF PAPETERIE DE LA SEINE, OF NANTERRE-SUR-SEINE, FRANCE.

PROCESS OF TREATING VEGETABLE AND TEXTILE FIBER, WASTE PAPER, WOOD-WASTE, AND THE LIKE FOR CONVERSION INTO PAPER MATERIAL.

1,041,791.

Specification of Letters Patent.

Patented Oct. 22, 1912.

No Drawing.

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*To all whom it may concern:*

Be it known that I, LUDWIG HERZ, citizen of Germany, residing at Nuremberg, Kingdom of Bavaria, German Empire, have invented certain new and useful Improvements in Processes for Treating Vegetable and Textile Fiber, Waste Paper, Wood-Waste, and the Like for Conversion into Paper Material; 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.

The present invention relates to a process by the employment of which vegetable and textile fiber, waste paper and wood can be rapidly and by cold treatment converted into a bleachable paper material.

According to the present invention the material to be treated is first soaked in a receptacle filled with a solution of caustic soda and water and then passed between press rollers into a churn or centrifugal machine. Any larger bodies or fibers remaining in the mass are crushed by the rollers before entering the centrifugal machine; in the latter the mass is then churned by suitable beaters in order to loosen it and gradually washed by the passage of water which removes the soda and all substances not necessary for paper-making. The resulting mass is now ready for further engine or hand treatment and may, if necessary, be bleached in known manner.

During the treatment of the mass in the churn or centrifugal machine, fresh material is introduced into the soaking receptacle, which will be sufficiently soaked by the time the first lot is churned and washed, so that work can be continued without interruption. If the soaking requires a greater length of time than the churning and washing, it will be advisable to provide two or more soaking receptacles for each churn, so that the work can be continued without interruption.

If necessary, the mass may be passed between rollers a second time in the centrifugal machine.

For treatment by the process the following materials are, for instance, suitable: grass-wrack, forest-hay, reeds, maize and sugar cane, jute, asparagus stalks and all other cheap vegetable substances having a

fibrous structure; further, rags and waste paper of any kind and in any condition. For instance, the rags may be oily or greasy, and the paper may be colored, printed on, or written on.

As soaking solution the following has been found suitable: 8 grams of caustic soda to 1 liter of water to which may be added 0.01 liter of aqua ammonia to prevent a possible crystallization of the soda.

Hard and tough materials may be soaked for several hours in this solution. The churning and washing in the centrifugal machine will, however, be accomplished in a much shorter space of time.

It must be mentioned that most of the abovementioned materials can only be bleached after treatment according to the present invention.

In the soaking receptacle rotating arms for stirring the mass may also be provided, in order to keep the mass in constant movement and to begin the work of disintegration.

If desired, the soda contained in the liquid leaving the centrifugal machine may be by suitable treatment again regained.

The material resulting from the process here described is very suitable as an insulating medium, for instance, instead of cork. For this purpose, the mass remaining in the centrifuge is taken out, mixed with chromic acid and size and then pressed. A good proportion is: 200 kilograms of the mass, 0.5 kilograms of chemically pure chromic acid and 4 kilograms of size.

It must further be mentioned that this process may also be used for cleaning linen or wool waste and the like. For this purpose, the materials to be cleaned are placed in the above-mentioned soaking solution for a suitable period and then washed until all traces of soda are removed. Also here it will be found advisable to soak the material under treatment in one receptacle and then to remove the soda in a second receptacle and to keep the material in constant movement by means of rotating arms in both receptacles.

I claim—

1. The process for treating vegetable and textile fiber, waste paper, wood waste and the like, for conversion into paper material, which consists in soaking the material to be

5 treated in a solution of caustic soda in water  
in the cold state, said solution containing  
ammonia in the substantial proportions of 8  
grams of caustic soda and .01 liter of aqua  
10 ammonia to each liter of water and at the  
same time starting the disintegration of the  
fibers while being so treated, pressing the  
mass so as to crush the solid material, then  
subjecting the mass to centrifugal action and  
15 at the same time washing and churning the  
material, subjecting the mass to further  
pressure while being churned and subjected  
to centrifugal action, and then subjecting  
the resulting material to treatment with  
20 chromic acid and size, the operations being  
conducted with the materials in the cold  
state.

2. The process for treating vegetable and  
textile fiber, waste paper, wood waste and  
20 the like, for conversion into paper material,  
which consists in soaking the material to be  
treated in a solution of caustic soda in water  
containing ammonia in the cold state and at

the same time starting disintegration of the  
material while being so treated, passing the 25  
mass between rollers whereby the solid ma-  
terial is crushed, then subjecting the mass to  
centrifugal action and at the same time  
churning and washing the same whereby  
caustic soda is removed from the material, 30  
subjecting the mass to further pressure while  
being churned and subjected to centrifugal  
action, and then subjecting the resulting ma-  
terial to treatment with a mixture of pure  
chromic acid and size in the substantial pro- 35  
portions of 200 kilograms of the material to  
be treated to 0.5 kilograms chromic acid and  
4 kilograms size, the operations being con-  
ducted with the materials in the cold state.

In testimony whereof I hereunto affix my 40  
signature in the presence of two witnesses.

LUDWIG HERZ.

Witnesses:

RALPH W. DOX,  
ELISABETH HELLMUTH.