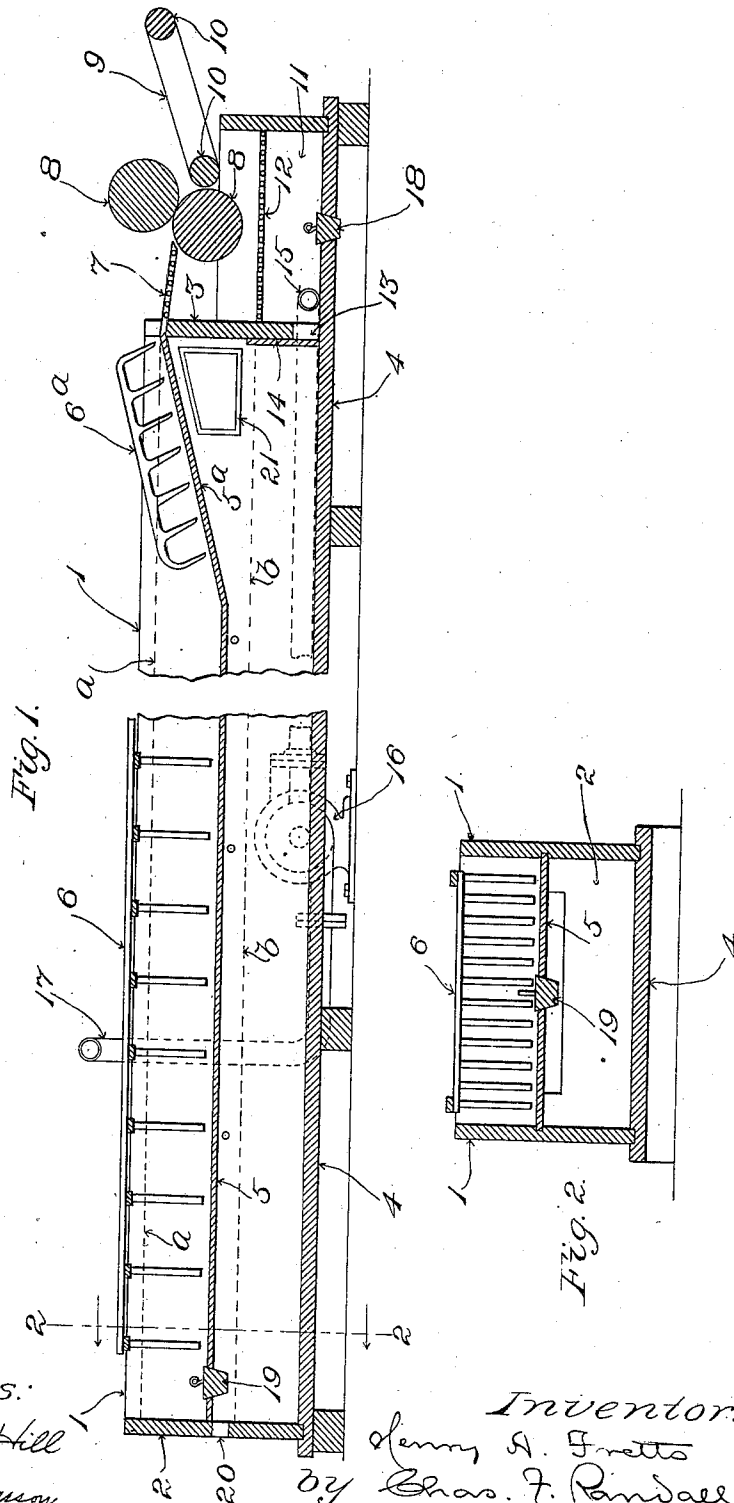


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 CARBONIZING AND WASHING OUT MACHINE FOR FIBROUS MATERIALS.
 APPLICATION FILED JUNE 17, 1908.

995,955.

Patented June 20, 1911.



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UNITED STATES PATENT OFFICE.

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Application filed June 17, 1908. Serial No. 438,902.

To all whom it may concern:

Be it known that I, HENRY A. FRETTS, a citizen of the United States, residing at Hyde Park, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Carbonizing and Washing-Out Machines for Fibrous Materials, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to machines of the general class employed in the treatment of fibrous materials with liquids.

It comprises an improved machine which is adapted for use in various processes of which such treatment is a feature, and especially in the process of carbonizing foreign matters which it is desired to remove from such materials. It is usual to subject wool to this process in effecting the removal of burs, shives, and other vegetable matters which are contained therein, one step of the process involving the treatment of the wool with an acid solution to attack the said vegetable matters, and a later step involving the use of water to wash out the acid remaining in the wool.

The general object of the invention is to provide a machine by means of which these two steps may be carried into effect by successive operations, with an economy in the use of the acid solution.

More particularly, the principal object of the invention is to produce a machine in which acid solution, or water, may be used, as required, and having provision for convenient storage of the acid solution without loss, when it is desired to use water in the machine.

My improved machine is constructed with an operating compartment to contain liquid into which the fibrous material is introduced for the purpose of a given step of the contemplated treatment, a storage compartment into which the said liquid may be emptied to permit the working compartment to receive a different liquid employed for another step, and within which storage compartment the liquid first mentioned remains until it is required to be used again, and means for returning the said liquid from the storage compartment to the operating compartment when required.

In the use of my machine for the purposes of the carbonizing process, the operating compartment would first receive the acid

solution. Then, after immersing the wool in such solution, the latter would be emptied into the storage compartment. The working compartment would receive the water used for washing out the acid, and the wool would be introduced thereto. Subsequently the water would be discharged from the working compartment, and the acid solution restored thereto.

The invention includes specific features of construction which will be specified hereinafter.

The invention is illustrated in the drawings, in which—

Figure 1 is a view in longitudinal section of a machine embodying the invention, only such parts being shown as are necessary to indicate the nature and design of the invention, and the intermediate portion of the machine being broken out to reduce the length of the view. Fig. 2 is a view in vertical transverse section on line 2, 2, of Fig. 1, looking in the direction indicated by the arrows adjacent the ends of such line.

The machine shown in the drawings is constructed with a long tank, the side-walls thereof being designated 1, 1, the end-walls being marked 2, 3, and the bottom being marked 4. The proportions of the tank are suited to the requirements of the work to be done. For instance, the tank may be forty feet in length between its end-walls, four feet in width between its side-walls, and three feet, three inches, in depth, inside measurement. A partition 5 extends horizontally from the end-wall 3 at the delivery-end, and then the portion 5^a of such partition inclines upward to the top of the intermediate portion of the said end-wall 3. This partition divides the tank into upper and lower compartments extending longitudinally of the tank, and constitutes the bottom of the upper compartment. The open-topped compartment constitutes the operating compartment, into which the fibrous material is introduced to be acted upon, and the lower compartment constitutes a closed storage compartment of capacity somewhat exceeding that of the working compartment.

At 6 is a rake or harrow, which in practice is constructed and actuated substantially as in wool-washing machines, (the actuating mechanism thereof being omitted in order to simplify the drawings) and by means of which the fibrous material that is fed into

the working compartment at the receiving or feeding end thereof is moved gradually along the machine.

At 6^a is a so-called carrier, by means of which the fibrous material is advanced finally up the incline 5^a at the delivery end. Such carrier is, in practice, constructed and operated as usual in wool-washing machines, its actuating mechanism being omitted so as to simplify the drawings.

The mechanisms for actuating the rake or harrow and the carrier may, if desired, be on the order of those, respectively, of the United States patent to C. E. T. Scribner for wool washer, No. 687,073, dated November 19, 1901, and to F. G. and A. C. Sargent for wool washing machine No. 433,583, dated August 5, 1890.

At 7 is a perforated shelf onto which the fibrous material passes from the incline 5^a, the liquid with which such material is saturated draining through the perforations, and at 8, 8, are a pair of press rolls for squeezing the liquid out of the fibrous material. 9 is a delivery apron passing around rolls 10, 10, upon which apron the material is received as it leaves the said press-rolls, and by which it is carried away.

At 11 is a small tank below the press-rolls to receive the liquid which drains or is expressed from the fibrous material, and 12 is a horizontal screen therein to catch any fibrous material which may fall.

Communication between the interior of tank 11 and the lower or storage compartment is provided for by means of an opening or passage 13 through the end-wall 3. In connection with the said opening or passage a closure-device or valve 14 is provided, conveniently arranged to be operated by hand or otherwise to close or open such opening or passage.

At 15 is a pipe leading from the interior of tank 11 to a pump 16, from which latter a pipe 17 leads into position to discharge into the upper or working compartment. By means of the said pump and pipe-connections, the contents of tank 11 may be drawn therefrom and caused to flow into the said compartment.

At 18 is a closure-device or valve in connection with an opening or passage through the bottom of tank 11. By opening the said opening or passage, the contents of tank 11 may be allowed to flow out of the machine.

At 19 is a closure device or valve applied to an opening or passage through the horizontal partition 5 which separates the upper and lower compartments from each other. By opening the said opening or passage, the contents of the upper compartment may be permitted to flow into the lower compartment, emptying the former into the latter.

When it is desired to treat wool by passage through an acid solution, the operating

chamber is filled with the latter to the level of the dotted line *a* of Fig. 1, communication between the said chamber and the storage chamber having been closed by means of valve or closure 19, and the passage at 13 between the drainage tank or receptacle 11 and the storage chamber having also been closed by means of valve or closure 14. The wool which is thrown into the operating chamber at the feeding end of the latter, namely, the left-hand end in Fig. 1, is advanced along such chamber by means of the rake or harrow 6, and by means of carrier 6^a is finally pushed up the incline 5^a and on to the shelf 7, passing thence between the squeeze-rolls 8, 8, and from the latter being received upon delivery-apron 9, by which last it is discharged from the machine. The liquid draining from the wool and squeezed therefrom by rolls 8, 8, is caught by tank 11, from which latter it is returned to the operating chamber by means of pump 16 and pipes 15 and 17. Should it be desired to wash out the acid from the wool which has been subjected to treatment with the acid solution, the closure or valve at 19 is opened so as to permit the said solution to flow from the operating compartment into the storage compartment below the same. Then the passage between the two chambers is closed again, and the top or upper chamber filled with water. The storage compartment being greater in capacity than the operating compartment, the entire contents of the latter are provided for and retained, the solution rising in the storage compartment to the level indicated by dotted line *b* in Fig. 1. At 20 is a sight-opening above the said level, in end-wall 2 at the feeding end of the tank, and at 21 is another opening, closed by a removable panel, above the said level adjacent the delivery end of the tank, to give access to the storage chamber. When the washing out operation is completed, the contents of the operating chamber may be drawn off or discharged from the same in any approved manner, as by means of an outlet controlled by a plug or valve, and those of the tank 11 may be emptied by opening the valve or closure at 18. After closing the latter, and opening the valve or closure at 14 so as to permit the acid solution to flow from the storage compartment into such tank, the said solution may be pumped from the tank into the operating chamber.

I claim as my invention:—

1. The improved machine for treating fibrous material with liquids, comprising, essentially, a tank divided horizontally into an upper or operating chamber and a lower or storage chamber proportioned to receive and contain the contents of the said operating chamber, the said storage chamber being adapted to keep its contents distinct from the liquid employed in the operating cham-

ber while treating such material with the said liquid, a direct passage from the operating chamber to the storage chamber, through which the contents of the former may pass into the latter, and means for transferring such contents from the storage chamber to the operating chamber again when desired.

2. The improved machine for treating fibrous material with liquids, comprising, essentially, a tank having a tight horizontal partition separating an upper operating chamber from a lower storage chamber proportioned to contain the contents of the said operating chamber, the said storage chamber being adapted to keep its contents distinct from the liquid employed in the operating chamber while treating such material with the said liquid, a direct passage from the operating chamber to the storage chamber provided with a valve or closure, through which the contents of the former chamber may pass into the storage chamber, and means for transferring such contents from the storage chamber to the operating chamber again when desired.

3. The improved machine for treating fibrous material with liquids, comprising, essentially, a tank having a tight horizontal partition separating an upper operating chamber from a lower storage chamber proportioned to contain the contents of the said operating chamber, the said storage chamber being adapted to keep its contents distinct from the liquid employed in the operating chamber while treating such material with

the said liquid, a direct passage from the operating chamber to the storage chamber provided with a valve or closure, through which the contents of the former chamber may pass into the storage chamber, means for transferring such contents from the storage chamber to the operating chamber again when desired, and means for advancing the fibrous material through the said operating chamber.

4. The improved machine for treating fibrous material with liquids, comprising, essentially, an operating chamber, a storage chamber proportioned to receive and contain the contents of the operating chamber, the said storage chamber being adapted to keep its contents distinct from the liquid employed in the operating chamber while treating such material with the said liquid, a direct passage from the former chamber to the latter provided with a valve or closure, squeeze-rolls at the delivery end of the operating chamber, a tank for receiving the expressed moisture, communicating with the said storage chamber, means for shutting off such communication while treating the said material with the said liquid, and means for pumping the contents of said tank into the operating chamber.

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

HENRY A. FRETTS.

Witnesses:

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