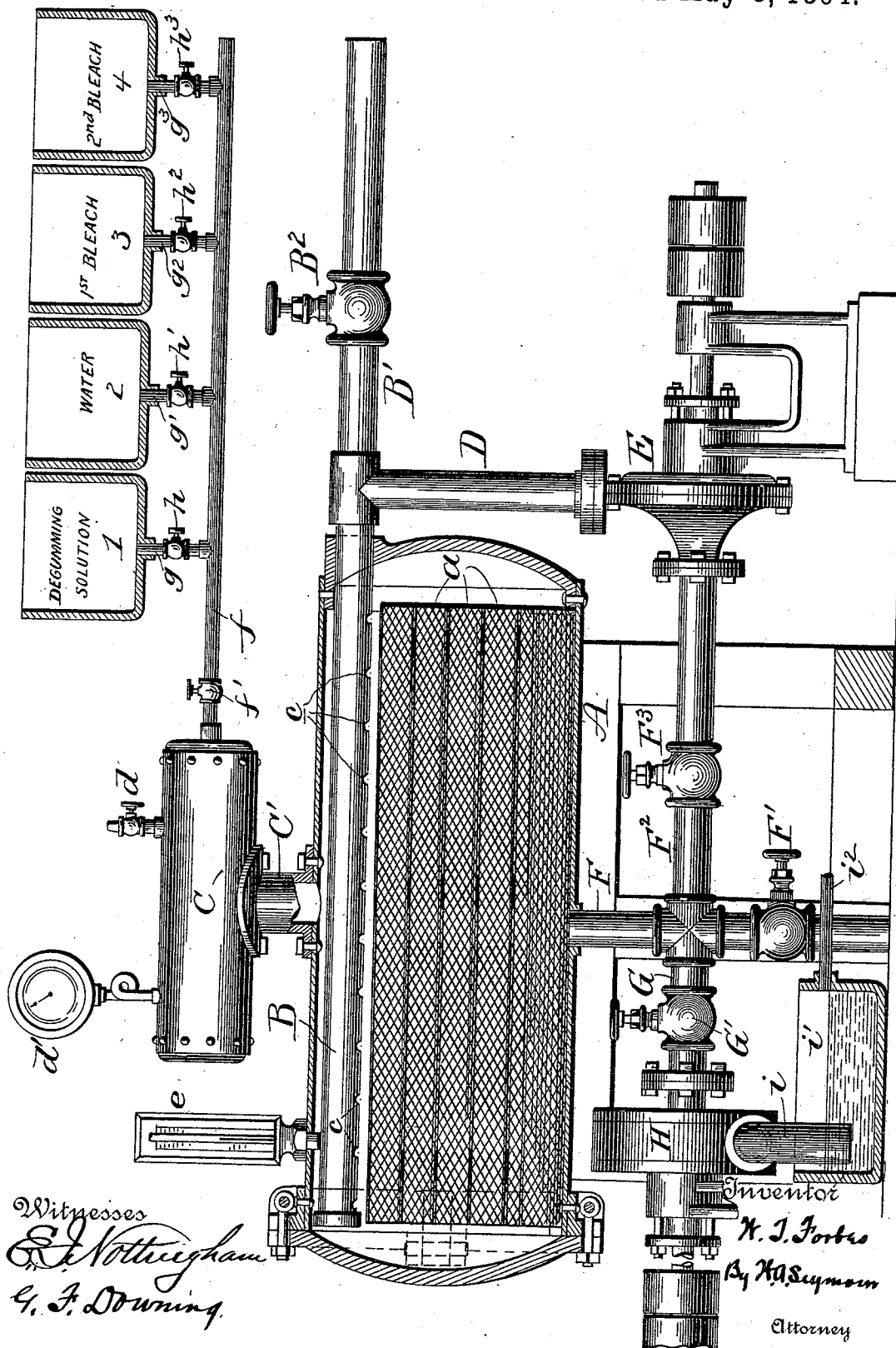


(No Model.)

W. T. FORBES.
APPARATUS FOR TREATING RAMIE.

No. 519,422.

Patented May 8, 1894.



Witnesses
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APPARATUS FOR TREATING RAMIE.

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To all whom it may concern:

Be it known that I, WALTER T. FORBES, of Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Apparatus for Treating Ramie; 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.

My invention relates to an improvement in apparatus for treating ramie and other fibrous growths,—the object of the invention being to produce simple and efficient means for removing the moisture contained in the fiber after it has been subjected to a cleansing or washing operation, without the necessity of removing said fiber from the vessel in which it had been washed or cleansed.

A further object is to provide an apparatus whereby ramie or other fibrous material can be thoroughly washed or cleansed of all extraneous matter and subsequently have the moisture contained in it, removed without the necessity of rehandling the fiber.

A further object is to provide means whereby ramie or other fibrous material, after having been subjected to a washing or cleansing operation, can have the moisture contained in it, removed by suction.

A further object is to produce an apparatus for the purposes stated, which shall be simple in construction, automatic in operation and effectual in the performance of its functions.

The accompanying drawing illustrates an embodiment of my improvements.

A represents a cylinder or receptacle, adapted to accommodate a number of baskets *a*. Each basket *a* is made of open material, such as wire cloth of comparatively large mesh,—the cover of the basket being made of the same material and each basket is preferably of a size to contain five pounds of crude ramie. Thus it will be seen that quite a number of baskets *a* will be provided, (each adapted to contain a comparatively small quantity of crude ramie) and therefore the fiber will be spread out and in such manner that the cleansing liquids will come into direct contact with every particle of the material and thus leave no portion thereof uncleansed. A

pipe B passes through the cylinder A and is provided with a series of comparatively large perforations *c* adapted to discharge downwardly on the fiber contained in the baskets *a*,—said pipe B being located in close proximity to the top of the cylinder or receptacle A so as to be entirely out of the way of the baskets *a*. With the pipe B, a steam pipe B' communicates and is provided with a valve B². A dome C is located above the cylinder or receptacle A and communicates therewith by means of a short pipe C'. The dome C is provided with an air cock *d* and also with a pressure gage *d'*,—both of which may be of any preferred construction. A thermometer *e* is located on the cylinder or receptacle A, whereby the temperature of the cylinder can, at all times, be ascertained. A pipe *f* communicates with the dome C and is provided with a valve *f'* preferably in proximity to said dome. The pipe *f* extends in proximity to a series of vats or receptacles, preferably under the same. I prefer to provide four such vats or receptacles which, in the drawing, are designated by the numerals 1, 2, 3, 4. The vats are connected with the pipe *f* by means of short pipes *g, g', g², g³*, having valves *h, h', h², h³*, respectively. The vat 1 is intended to contain a solution capable of dissolving the gummy substance contained in ramie or other fibrous growths and this solution I term a "degumming solution." The vat 2 is intended to contain water. Vat 3 is intended to contain a bleaching solution and vat 4 is intended to contain another bleaching solution which may sometimes be necessary. A pipe D communicates at one end with the pipe B at a point near the receptacle A and at the other end, said pipe D communicates with a circulating pump E of any preferred construction. The pipe D should be of an area equal to the combined area of all the perforations *c* of the pipe B. A pipe F communicates at one end with the bottom of the cylinder or receptacle A, the lower end of said pipe F being open and provided at a point near its end, with a valve F'. Through this pipe the liquid contents of the cylinder or receptacle A can be discharged. At a point between its ends the pipe F is connected with the circulating pump E by means of a suitable pipe F², in which a valve F³ is

located. A pipe G having a valve G' also communicates at one end with a vacuum pump H. The shafts of both pumps will be provided with tight and loose pulleys for the reception of suitable straps from a counter-shaft, to which latter power can be transmitted in any suitable manner. The vacuum pump H is provided with a discharge pipe *i* adapted to project into a tub or receptacle *i'* beneath the surface of a quantity of water in the tub, whereby to prevent the admission of air into the discharge pipe *i*. A quantity of water can be maintained in the tub or receptacle *i'* by means of an overflow pipe *i''*.

In starting the apparatus, the valves *f'* and *h* will be opened to permit the degumming solution in the vat 1 to flow through the pipes *g*, *f*, and dome C into the cylinder or receptacle A until the latter is completely filled,—after which the valves *f'*, *h*, will be closed. Steam will be admitted through the pipe B, which steam will escape through the perforations *c* in said pipe and permeate the ramie contained in the baskets *a* and heat the same and the degumming solution. I prefer to admit sufficient steam to the cylinder or receptacle A to maintain a temperature of about 300°, which heat will be continued during the treatment of the ramie by the degumming solution. When the degumming solution shall have been introduced into the cylinder A, the circulating pump E will be brought into operation, which will cause the fluid to pass from the bottom of the cylinder or receptacle A, through the pipes F, F², the circulating pump E, pipe D and pipe B and will be discharged through the perforations *c* in said pipe B. This circulation of the degumming solution will be continued a sufficient length of time to dissolve the gum in the fiber and, to a great extent, free it therefrom,—the action of the pump E causing the solution to pass through the fiber in an efficient manner. After causing a circulation of the degumming solution for a proper length of time, the pump E will be thrown out of action, the valve B³ will be closed and said solution will be withdrawn through the pipe F,—after which the valves *f'* and *h'* will be opened to admit water to the cylinder or receptacle A from the vat 2. The valves *f'* and *h'* will then be closed and the water made to circulate in the same manner as above described to wash any gummy matter that had not been previously removed from the fiber and also the degumming solution that adheres to the fiber. After thus washing the fiber, the water will be drawn off through the pipe F and one of the bleaching solutions (or both of them successively, if necessary) will be made to circulate through the ramie in the cylinder or receptacle A and will be finally withdrawn through the pipe F. After having thus cleansed and bleached the ramie I next proceed to remove the moisture which may remain in the fiber, without re-

moving the latter from the cylinder or receptacle A. This step in the process of treating the ramie is of very great importance, as I am enabled to remove the moisture from the cleansed and washed fiber without the necessity of rehandling it. It has heretofore been customary, after cleansing and washing the fiber, to remove it from the washer and pass it through a wringer, similar to a clothes wringer having flexible rolls. This method of removing the moisture is objectionable for many reasons, not the least important of which is the necessity for rehandling the fiber.

In proceeding to remove the moisture from the fiber while it is still in the cylinder or receptacle A (all the valves being closed) I open the valve G' and start the operation of the vacuum pump H. The action of the pump H will be to create a partial vacuum in the cylinder or receptacle A and to withdraw, by suction, the moisture from the fiber and discharge the same through the exhaust pipe of the vacuum pump.

Actual experiment has demonstrated that by the use of a vacuum pump in the manner above explained, the moisture in the fiber can be easily, quickly and very effectually drawn out of the fiber, while it remains in the cylinder in which it had been washed and bleached.

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

1. The combination with a receptacle constructed and adapted to hold the material under treatment, a dome in communication with the receptacle, pipe leading into the dome, a valve in said pipe, a number of vats, pipes connecting said vats to the pipe leading into the dome, and valves in said vat pipes, of a steam pipe discharging into the receptacle, a pipe leading from the receptacle, for discharging liquids therefrom, and means connected with this pipe for removing moisture from the material contained in the receptacle, substantially as set forth.

2. The combination with a receptacle for holding the material to be operated upon, a dome, and vats discharging into this pipe, of a steam pipe discharging into the receptacle, a valve in the steam pipe, a pipe F leading from the receptacle, a valve in the lower end of said pipe F, pipes G and F² leading from pipe F, valves in pipes G and F², pipe D leading from pipe F² to the steam pipe, circulating pump E at the juncture of pipes D and F² and a vacuum pump H connected with pipe G, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WALTER T. FORBES.

Witnesses:

R. S. FERGUSON,
C. S. DRURY.