L. W. Wright.

Pulp Digester.

No. 6,980. Patented Dec. 25, 1849.

Fig. 1.

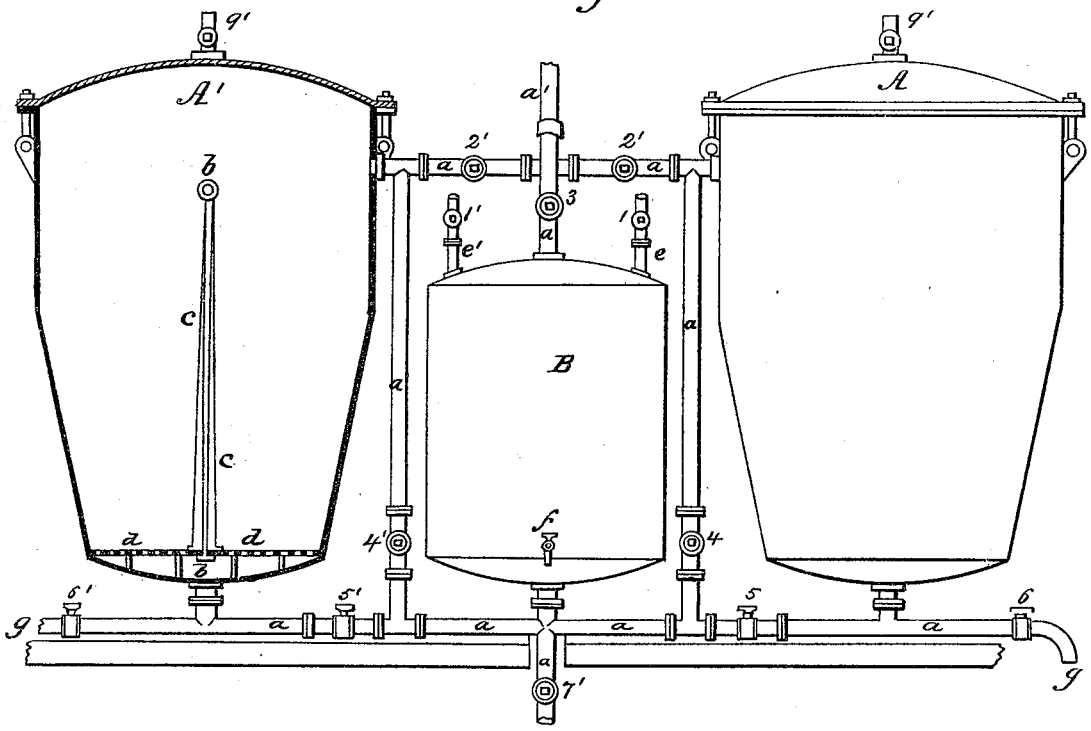
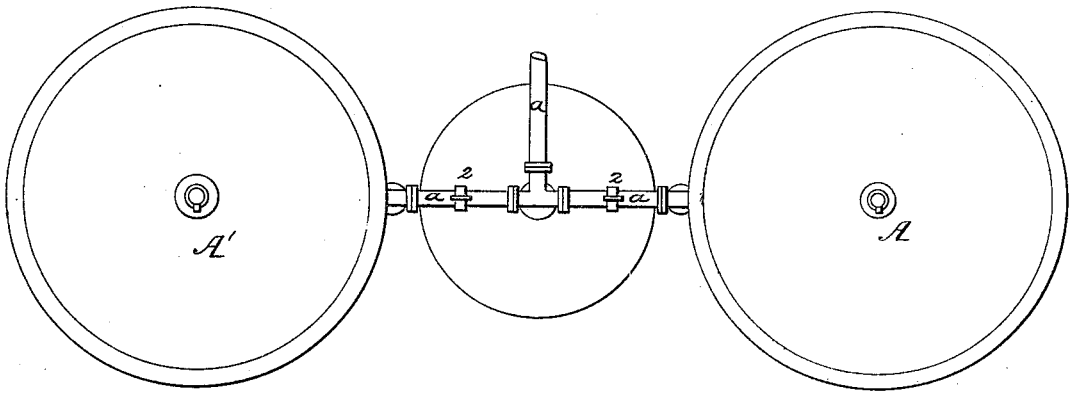


Fig. 2.



UNITED STATES PATENT OFFICE.

LEMUEL W. WRIGHT, OF PLAINFIELD, NEW HAMPSHIRE.

APPARATUS FOR AND PROCESS OF ROTTING HEMP AND OTHER FIBROUS MATERIALS.

Specification of Letters Patent No. 6,980, dated December 25, 1849.

To all whom it may concern:

Be it known that I, LEMUEL WILLMAN WRIGHT, of Plainfield, in the State of New Hampshire, in the United States of America, but now temporarily residing in London, England, have invented an Improved Method of Separating the Fibers of Certain Vegetable Substances.

The nature of my invention is to treat hemp, flax, china grass and other vegetable fibrous substances in such a manner as will more perfectly separate the fibers of such materials for manufacturing them into yarns than has hitherto been done,—and consists in macerating said materials in properly constructed vessels with alkaline solutions, at a high temperature, and afterwards in cleansing and drying the material without previously handling it whereby the fibers would become tangled and unfit for the uses intended.

Figure 1, shows a side elevation of one arrangement of the apparatus partly in section, and Fig. 2, shows a plan view of the same.

A′ A are two vessels or keirs with movable covers made of cast iron or other proper material of any proper size and shape, and sufficiently strong to withstand the force of the pressure of steam to which they are to be subjected and are placed in an upright position on a buck or other proper foundation.

A′ is shown in section, at the bottom of which will be seen a perforated disk or grating resting on support the outer edges of this disk closely fitting the shape of the keir, in the center of this disk is affixed an upright bar or rod *b* of iron, with a ring at the top to aid in raising the disk from the keir; outside the rod *b* is seen a conical shaped upright iron piece *c* the lower part of the keir A being conical toward the bottom, the object of which is to prevent the steam from passing around and down the sides of the material when packed, and the more conveniently to lift or raise the mass from the keir by the aid of the rod *b* and perforated disk *d*. In the top of each keir is seen a pipe and cock *g*, *g*′, *g*′ for blowing off air and steam, and to the bottom and sides of the keirs are seen pipes *a a a a* connecting both keirs with the top and bottom of B another vessel, the purpose of which will be more fully described hereafter. I place the two keirs in connection with the smaller vessel B to be used alternately for convenience, while one or more than two might be sometimes advantageously used. The keirs and pipes should all be covered with felt or some substance, to prevent as far as possible all radiation of heat. In working the process, a boiler is necessary for generating high steam, and connected with the pipe *a*′. Also a vessel containing a good supply of hot water, connected with the pipe *e*′; and another for the alkaline solution (I prefer potash or soda ash at a strength of about 10° hydrometer) and connected with the pipe *e* and a vessel of proper size for soaking the material to be operated on before placing it in the keirs. All these three vessels may be made of wood, and are connected by pipes to the boiler for steam to heat their contents; as neither of these vessels need further description they are not shown in the drawing. I proceed in the following manner. I take either flax, hemp, or china grass, in the state in which those materials are usually sold in the market and place it carefully for soaking in the vessel before alluded to,—when properly filled place a grating of iron or other material in the top, and fill with warm water, and let on the steam, so as to keep the mass at about 100° heat for 24 hours. A proper aperture in the bottom is then opened, the steam shut off and it is left to drain. The top or covering of the keir A′ is then removed and all the cocks closed, the material is then packed evenly and closely upon the perforated plate or strainer *d* until with layer after layer the keir is filled to about ½ to ¾ its depth. A heavy iron grating is then placed on the top to confine the mass and the steam is allowed to flow through the mass from the bottom until the mass is all heated through. Then the cover is placed on again in the usual manner to make it steam tight. Now open the several cocks 2′ and 9′ and the steam will flow into A′ and when the air is forced from the keir close 9′. Now open cock 1′ and fill B with hot water, then close 1′ open 3 and 4′ and the water will be forced into the top of the keir. Then close 3 and 4′ and open 2′ and 5′ and the water will be forced down through the mass and into B until it has all so passed, again into the vessel B repeat this operation several times until the material is well washed, then with the cocks 3, 5 and 6′ open, the water will be driven off at the waste pipe 3′, after which

open only 2′ and 6′ and blow steam for a few minutes during which time open 1′ and fill B with the alkaline liquor, then close again all the cocks and open 3 and 4′ and force the liquor into A′ as before, then reverse in the same manner the cocks as to cause the liquor to flow alternately from A′ to B until the alkali is spent which the gage cock *b* will enable the attendant to inspect, this done let off the alkali liquor by the pipe and cock 7 to some vessel to retain it for the soaking vat or for other purposes. Then fill again several times with hot water which pass and repass as before to rinse the mass well until the water comes clear, then I fill B with soap and water of proper strength and pass and repass this several times, then let this off, and repeat with hot water until it flows away quite clear. I then close all the cocks save 2′ and 6′ and let the whole force of the steam blow through the mass to dry it. I then close all the cocks and open 9′, and as soon as possible remove the cover of the keir and hoist out the mass, sometimes I have passed hot air through but this is attended with more trouble than to remove the material to a drying chamber, it being important that it should be made quite dry.

In conclusion I do not confine myself to the particular apparatus nor the form or arrangement thereof as herein described, but that which I do claim as my invention and desire to secure by Leters Patent is—

1. The treating of hemp, flax, china grass and other vegetable fibrous substances in preparing them for spinning into fine yarns by steam, alkalin, and saponaceous solutions and drying the same by steam as herein before described without handling the same during the process thereby saving much labor and expense, as well as avoiding loss of material from tangling, matting etc.

2. I claim the combination of the vessels A′ B and A with their connecting pipes arranged so as to operate upon the hemp &c. with the steam and solution in the manner described herein or such other arrangement as shall include substantially the same process.

LEMUEL W. WRIGHT.

Witnesses:
JAMES M. CURLEY,
JOSEPH MARQUETTE.