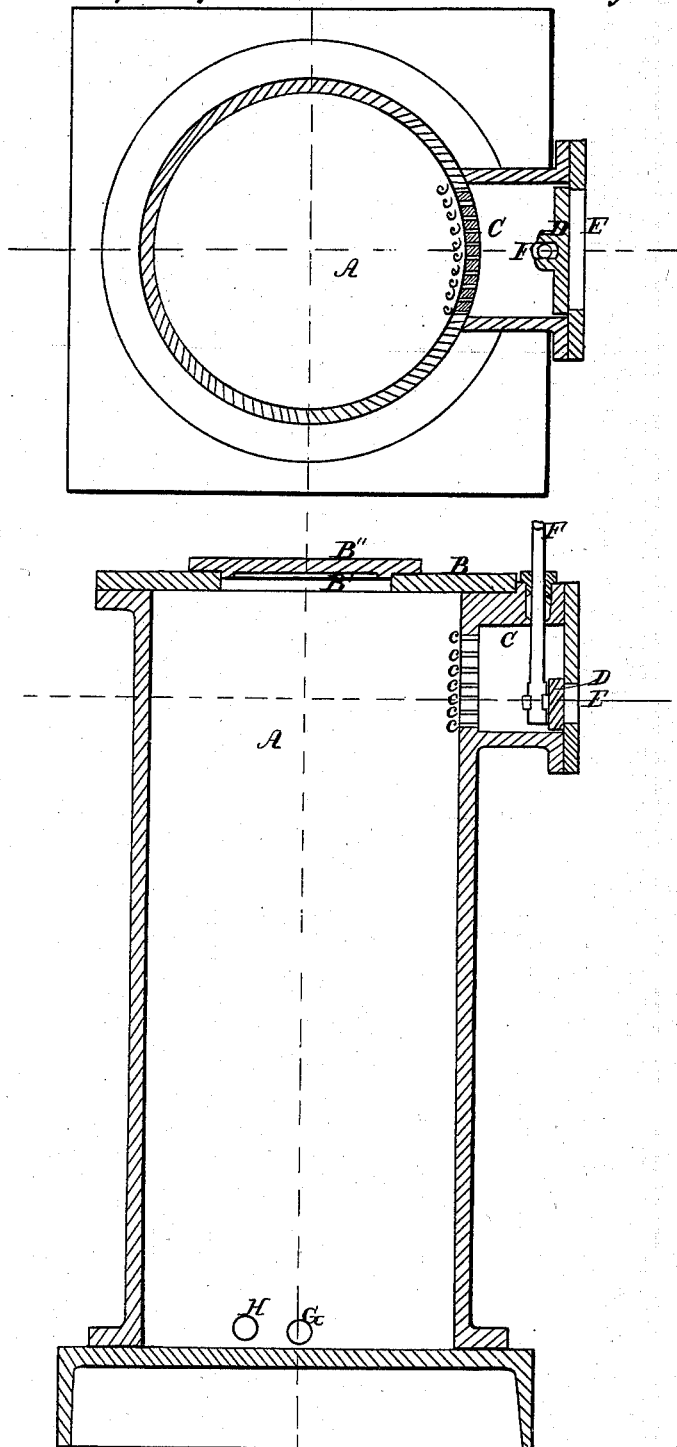


J. B. Fuller & J. P. Upham.
Pulp Digesters.
N^o 47,539. Patented May 2, 1865.



Witnesses;
A. L. Henssick
& W. W. Holden

Inventors;
John B. Fuller
James P. Upham

UNITED STATES PATENT OFFICE.

JIM B. FULLER AND JAMES P. UPHAM, OF CLAREMONT, NEW HAMPSHIRE.

IMPROVED PROCESS FOR SEPARATING THE FIBERS OF HEMP, FLAX, &c.

Specification forming part of Letters Patent No. **47,539**, dated May 2, 1865; antedated April 18, 1865.

To all whom it may concern:

Be it known that we, JIM B. FULLER and JAMES P. UPHAM, both of Claremont, county of Sullivan, and State of New Hampshire, have invented a new and useful Method of Separating the Fibers of Hemp, Flax, and other Similar Substances; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section, and Fig. 2 is a horizontal section, of an apparatus in and by which our invention may be performed.

The same letters of reference indicate like parts in both figures.

Heretofore such fibers have been separated by subjecting them while in a close vessel to the pressure of steam, and then discharging them into open air or into a space where there is less pressure.

The nature of our invention consists in separating the fibers of hemp, flax, and other similar substances while they are in a vessel in which they have been subjected to the action of steam under pressure by suddenly relieving such pressure and allow the steam to suddenly escape from such vessel, the fiber being retained in the vessel.

An apparatus in and by which our invention is performed may be of various constructions, but the one herein described we consider the best adapted to the purpose.

In the drawings, A is a cylinder of suitable size and strength. B is a cover secured to the top of A. B' is a man-hole, to which is secured the man-hole plate B''. C is a steam-chamber. c c c c c c c are holes made through the side of A, and lead from the interior of A to the interior of C. D is a slide-valve working on the inside of the chamber C, and opening and closing the port E. F is a valve-rod, by which the valve D is operated. G is an aperture near the bottom of the cylinder A, through which steam from a boiler is admitted to the cylinder A. H is an aperture near the bottom of the cylinder A, through which the water of condensation is drawn off from the cylinder A.

The operation of the apparatus thus far described is as follows: The fibrous material, either in its natural condition or after being treated by any of the known methods for extracting or dissolving out the gummy and other foreign matter, is placed through the man-hole B' into the cylinder A. The man-

hole plate B'' is then secured in its proper position by bolts or otherwise. If required, the fibers may be boiled with water or other liquid while in the cylinder A, for the purpose of extracting or dissolving any foreign matter remaining with the fibers. If this is done, the water or other liquid used should be drawn off before the operation proceeds. Steam from a boiler is then admitted through the aperture G into the cylinder A, and is allowed to remain until the fibrous substance is sufficiently steamed, which time the operator will judge by the effect of steam on the stock used.

The point or degree of pressure and temperature of steam required must also be governed by the judgment of the operator. The water of condensation is then drawn off from the cylinder A through the aperture H, and steam-valve D is suddenly opened by means of the rod F, allowing the steam to instantly escape from the cylinder A, causing a sudden and powerful expansion of the steam contained around and between the fibers, and producing a partial separation of the fibers. This last operation may be repeated until the fibers are sufficiently separated. The fibers may then be removed from the cylinder A through the man-hole B', and dried and dusted and manufactured into fabrics, accordingly to their nature.

We do not claim, broadly, the use of the expensive force of steam for separating fibers, as the same has been used to separate fibers as blown out of a vessel. In this case the fibers are dispersed, and before they can be gathered again lose most of their heat and moisture. With our apparatus the fibers are not blown out of the vessel containing them, and are kept hot and moist by the steam during the several operations.

What we claim, and desire to secure by Letters Patent, is—

The mode herein specified of separating vegetable fibers while retained in a suitable vessel by subjecting such vegetable fiber to the action of steam under pressure, and then to a series of expansions derived from the sudden discharge of steam (but not fiber) from such vessel as and for the purposes specified.

JIM B. FULLER.
JAMES P. UPHAM.

Witnesses:

H. L. HENDRICK,
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