

# UNITED STATES PATENT OFFICE.

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## TREATMENT OF FLAX IN THE RETTING OR STEEPING PROCESS.

SPECIFICATION forming part of Letters Patent No. 304,910, dated September 9, 1884.

Application filed December 26, 1883. (No specimens.)

*To all whom it may concern:*

Be it known that I, ROBERT HANHAM COLLYER, a citizen of the United States of America, and residing at Southwark, in the county of Surrey, England, have invented certain new and useful Improvements in the Treatment of Flax in the Retting or Steeping Process, of which the following is a specification.

This invention has for its object obviating the objectional features attending the ordinary "retting" or steeping process to which flax-straw is usually subjected and obtaining a superior fiber with great facility, expedition, and economy. According to my invention the flax-straw is first boiled in a saponaceous solution under the conditions hereinafter described, and is then submitted to a squeezing or pressing process, a stream of water being preferably caused to act on the fibers after they have been removed from the solution and before they are passed through the squeezing or pressing apparatus, as hereinafter explained.

The ordinary retting or rotting process consists in steeping the straw in water until the putrefactive fermentation has subsided, which usually takes place after from eight to fourteen days, according to the temperature of the water, which is dependent on the condition of the atmosphere. The product obtained by the ordinary process is irregular in quality. If retted too much, the fiber is seriously weakened, and if not sufficiently retted it is most difficult to clean, and in all cases the fetid exhalations resulting from the putrefactive fermentation are most prejudicial to health. Further, with certain descriptions of flax it has hitherto been found impracticable to obtain by the ordinary process any product at all suited for being manipulated for conversion into textile fabrics. In the improved process, conducted according to my invention, all these objections are obviated and a very uniform and superior product is obtained with a great saving of time and labor.

In carrying out my said invention in practice the flax-straw is first made up into relatively small bundles, preferably into loose bundles or sheaves, weighing about two pounds each. These bundles or sheaves are then placed

in a cage, frame, or receptacle of open-work or reticulated or perforated materials, which, when placed in a boiler or vessel containing the saponaceous solution, will not impede the action of the said solution. This cage or frame may in some cases be dispensed with and the bundles be placed directly into the boiler or vessel, but its use will facilitate the operation. The cage and its contents are immersed in a saponaceous solution, which may be prepared by dissolving from one and a half to three pounds of white curd soap to every hundred pounds of flax-straw in sufficient water to cover the straw. In case I use the subcarbonate of crystallized soda known as "washing-soda" in connection with soap, I take from two and one-half to five pounds of soap and three pounds of the soda carbonate to each hundred pounds of the straw. Although I have mentioned white curd soap, this being what I have found to give the best results, I do not limit myself to this particular kind of soap, as other hard soaps or like saponaceous material or materials capable of giving a saponaceous compound or solution may be employed in preparing the solution. This saponaceous solution being heated to boiling-point, combines with the glutinous and resinous matter associated with the fiber in the flax-straw, and enables the woody part or boon to be subsequently separated from the fibrous part with great facility, acting efficiently on each individual straw contained in the bundles, owing to the smallness and looseness of the said bundles, which enables the liquid to readily permeate their entire mass and efficiently act upon the straws in the center of each bundle as well upon the straws at the exterior. By contact with this solution the quality of the fiber ultimately obtained is greatly improved, being rendered soft and silky without in the least impairing its strength.

The straw made into bundles, as hereinbefore mentioned, is exposed to the action of the solution in the boiler or vessel for a period varying from two and a half to four hours, according to the strength of the solution employed. When the solution is prepared with

a large proportion of soap, the duration of the exposure is correspondingly shortened. In case the saponaceous solution contains washing-soda, as hereinbefore provided, the time required for the boiling operation will be from four to six hours. When the flax has been grown on a cretaceous soil, oxalate of ammonia should be added to the solution, in the proportion of about one ounce of the oxalate to ten gallons of the solution, in order to neutralize or counteract the effect of the lime in the flax-straw and water. After being boiled the required time calculated according to the directions hereinbefore set forth, the bundles of straw are removed from the boiler or vessel, which may be effected, if a cage be used, by hoisting the said cage out of the boiler or vessel by means of a crane or other equivalent apparatus, and the flax is submitted to a squeezing or pressing operation, which may be conveniently effected by passing it between a pair of smooth cylinders or rollers, preferably covered with vulcanized india-rubber, say about half an inch thick. Before being thus squeezed or pressed, however, the prepared straw is preferably washed by passing it through a stream of water or otherwise in such a manner as to be thoroughly washed and cleansed from all extraneous matter. For this purpose the water used for washing the prepared straw should be caused to flow in a continuous stream of fresh water through the mass of straw, so as to flow or percolate there-through and wash the latter effectually at every point. The straw thus prepared and washed is now submitted to the aforesaid squeezing or pressing operation, for example, by being caused to pass between the rollers hereinbefore referred to, which rollers may be pressed together by springs or yielding connections with considerable force, as in the case of the rollers of powerful wringing and and mangling machines, and their function is to express all or practically all of the remaining free extractive matter contained in the prepared straw, and at the same time to render the said straw as free as possible from moisture. The employment of these rollers, in combination with the preparing and wash-

ing processes conducted in the manner hereinbefore specified, is attended with excellent results, and enables the straw to be delivered under the most favorable conditions for the subsequent desiccation and other operations of scutching and preparing the flax for the market, which are greatly facilitated by the employment of flax prepared according to the combined treatment hereinbefore described. The resinous matter which is so injurious to the persons employed in scutching the flax is entirely removed in the treatment according to my invention, which is not the case with flax retted or steeped according to the ordinary method.

I claim—

1. In the treatment or preparation of flax, first boiling the flax-straw in a saponaceous solution, then submitting the said straw to a washing process, and subsequently to a squeezing or pressing operation, substantially as and for the purpose hereinbefore described.

2. In the treatment or preparation of flax, first boiling the flax-straw in a saponaceous solution and subsequently subjecting the said straw to a pressing or squeezing operation, substantially as and for the purpose hereinbefore described.

3. As a step in the treatment or preparation of flax fibers, making the flax-straw into bundles or sheaves, then placing them in a boiler or vessel, (with or without the intervention of a cage, frame, or open-work receptacle,) and subjecting them to the action of a boiling saponaceous solution, substantially as hereinbefore described.

4. As a step in the preparation or treatment of flax, boiling the flax-straw in a saponaceous solution containing oxalate of ammonia, substantially as and for the purpose hereinbefore described.

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

ROBT. H. COLLYER.

Witnesses:

W. S. DINES,

CHAS. MILLS,

Both of 47 Lincoln's Inn Fields, London.