

# UNITED STATES PATENT OFFICE.

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## PROCESS OF DISINTEGRATING FIBROUS SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 396,981, dated January 29, 1889.

Application filed December 13, 1888. Serial No. 293,415. (No specimens.)

*To all whom it may concern:*

Be it known that I, SIDNEY SMITH BOYCE, of the city, county, and State of New York, have invented an Improved Process of Disintegrating Fibrous Substances, of which the following is a full, clear, and exact description.

The object of this invention is to effect the direct and speedy separation of the fibers from the natural straw of fiber-bearing plants—such as flax, hemp, ramie, and jute; also, to remove from the fibers the adhering gummy, resinous, glutinous, and mucilaginous substances; and, also, to bleach the fibers and impart to them soft and pliable qualities and a polished or glossy finish.

My invention consists in such mechanical and chemical treatment of the fibers of said plants as will be hereinafter described and claimed.

In the practice of my invention I take the natural straw of the flax or other fibrous plant and subject the same to the action of a suitable breaking mechanism until the said straw is thoroughly broken and the boon and woody substances broken up and removed from the fibers, so far as the same can be effected by the breaking operation. Any of the well-known forms of breaking-machines suited for the particular plant or straw to be treated may be employed for the above purpose; hence a particular description of such mechanisms is not here necessary. The fibrous material recovered from the straw, as above described, I then place in a suitable vessel containing a boiling solution of soap and water, which solution must be neutral in respect to alkalies, and, preferably, rich in respect to oleaginous matters, made by dissolving from four to six ounces of such soap to the gallon of water, in which solution I boil the fibrous material for a period of from one to five minutes, according to the nature of the fiber, which completes the treatment, whereupon the fiber is removed from the vessel and allowed to dry. Any suitable means to hasten the drying may be employed. When dried, I subject the fiber to rolling between plain or fluted rolls to finish the same. The effect of this finishing process upon the fibers is to disintegrate, perfect, gloss, and polish them and impart to them a soft, fine, and silky quality, which is highly desir-

able. I do not confine myself to rolling; but other means for separating the dried masses of fibers may be employed—as, for instance, they may be picked apart or separated by hand.

The effect of boiling the fibrous material in the saponaceous solution is to remove at once, to a great extent, the glutinous, mucilaginous, resinous, gummy, and coloring matters, and other impurities, and to clean, bleach, dress, and separate the fibers and render them fit for immediate use in the arts for spinning and other purposes.

The success of my invention depends in thoroughly breaking the flax or plant and removing the boon, and in then boiling the fibers for a brief period in a neutral saponaceous solution, or, preferably, a solution rich in oleaginous matter.

The strength of the solution required slightly varies, as does the time of boiling, according to the nature of the fibrous material. Fibers from good bright flax straw require four ounces to the gallon of water and one minute's time of boiling. An overripe fiber will require six ounces to a gallon of water with about one minute's boiling, although for less perfect results the strength may be diminished, and for a softer and more silky fiber the strength may be increased. For ramie, four ounces to a gallon of water and about one minute's boiling are sufficient. For hemp, four to six ounces to the gallon of water and from three to five minutes' boiling may be employed; or the treatment may be repeated in a solution of four ounces to the gallon of water and with one minute's boiling each time.

To produce the soapy solution rich in oleaginous matter, the soap may be specially made by saponifying an excess of oily or fatty matter therewith, or a quantity of oil or other fatty matter may be heated to the boiling-point and an equal amount of soap dissolved therein by boiling and agitating while a small amount of water is added.

I have in the foregoing description stated the essential steps I employ for obtaining the fibers in a condition fit for use in the arts.

I will now mention a few additional details of my practice which have a tendency to increase the excellence of the results I obtain—



namely, before boiling in the soapy solution the fibrous material may be subjected to the action of hot or boiling water and cleansed. In preparing the saponaceous bath I prefer to  
5 use a good soap made high in animal or vegetable oils. The effect of using such soap is to render the fibers more soft and pliable. After treatment of the fibers in the saponaceous bath, the fibers may be rinsed in water and  
10 then dried.

As results of my invention I do away with the tedious, expensive, and difficult modes of treating flax and other fibrous plants heretofore deemed necessary—such as long retting,  
15 long boilings, treatments with alkalies, acids, mineral oils, and bleaching and scutching, &c.—by which, as I believe, the fibers are more or less wasted, weakened, and injured, and I substitute in lieu thereof the quicker, more  
20 simple, and more economical modes of treat-

ment herein described, by which the natural strength of the fiber is preserved, a larger amount of fiber obtained and of light color, and its best qualities developed.

Having thus described my invention, what I 25 claim as new, and desire to secure by Letters Patent, is—

The process of disintegrating fibrous substances, consisting of, first, breaking the straw; second, subjecting the fibers to the action of 30 a boiling neutral soapy solution made by dissolving soap high in fatty matters in water; third, drying the fibers, and, fourth, subjecting the dried fibers to rolling and finishing, as herein described.

SIDNEY SMITH BOYCE.

Witnesses:

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