UNITED STATES PATENT OFFICE.

ALPHEUS W. MONTGOMERY, OF NEW YORK, N. Y.

METHOD OF TREATING SISAL, &c.

SPECIFICATION forming part of Letters Patent No. 400,782, dated April 2, 1889.

Application filed April 13, 1888. Serial No. 270,605. (No specimens.)

To all whom it may concern:

Be it known that I, ALPHEUS W. MONTGOMERY, a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented an Improvement in Methods of Treating Sisal, &c., of which the following is a description in such full, clear, concise, and exact terms as will enable any one skilled in the art to which my invention appertains to practice the same.

Sisal fiber is obtained from a leaf in which the fibers grow separately, each completely surrounded by or embedded in the fleshy or pulpy material of the leaf. The leaf is cut while green, and is in that condition passed between rollers, by means of which the plant is crushed and as much of the pulp as possible squeezed out. The fibers are then washed and dried and are in the condition of sisal—or "sisal-hemp," as it is sometimes called—of commerce. It will be observed on the examination of sisal treated in this way that the fibers are reduced to their ultimate fineness, or, in other words, that each fiber is separate from its fellows. These fibers are not, however, yet in condition for spinning. By no means all of the pulp is removed from the fiber by squeezing and washing the leaf, as above set forth. Indeed, a very large amount of pulp still adheres to it, quite firmly attached to and almost, if not entirely, surrounding and inclosing the individual fibers. In this crude sisal or sisal-hemp only from six to ten per cent. of the entire mass is pure fiber. The rest is dried pulpy or woody material. Now, before the sisal-hemp is made into rope, twine, and other articles of manufacture in which it is used, it is necessary to separate and remove as perfectly as possible this dried pulpy coating. It is also desirable to render the fiber, by the application of oil, emulsion, or other lubricant, limber and pliable, since the raw sisal is naturally harsh, stiff, and not well adapted to use in the arts. The oil also has the effect of rendering the fiber insensible to atmospheric changes and more durable. The method now employed for accomplishing these results is substantially to apply oil or lubricant to the fiber after the major part of the pulp has been separated therefrom in the green state and the fibers reduced to their ultimate fineness, but before the fiber has been completely cleaned by the removal of the residue of the pulp, so as to be in condition for spinning. The sisal thus oiled is passed through machines—such as hatcheling-machines, breakers, spreaders, and drawing-frames—which clean the fiber and prepare it for the spindles. While this treatment has the effect of removing to a certain degree the remaining pulpy matter, it is open to serious objections. In the first place, the oil, emulsion, or other lubricant, being applied to the fiber while it is still incased in its pulpy coating, does not properly act upon, to soften or make pliable, the fiber itself. In the second place, the pulp absorbs the oil and makes it less fragile or less readily disintegrated, and causes it to adhere to the fiber, and prevents the machine properly from disengaging it, and, lastly, the oil which is absorbed by the pulp is wasted when the pulp is separated from the fiber.

The objects of my present invention are to avoid the objections above pointed out and by a simple process to diminish the cost of preparing and working the material, and to improve the treatment of the hemp and also the quality of the cleaned fiber and the articles manufactured of it.

The process I prefer to employ in accomplishing the above result may be thus described: I take sisal after its ultimate fibers have separated from each other, but while each is still incased in its thin coating of dried pulp, and I pass it through the ordinary combing or hatcheling machines—such as breakers, spreaders, and drawing-frames, or other suitable devices—and thereby disintegrate and loosen from the fibers their pulpy coating, which, when dry, is broken and removed as dust, and I continue working it, while still dry, through the preparatory machines until it has been sufficiently cleaned and all foreign matter removed therefrom and the fiber properly combed. Other devices than those mentioned may be employed for cleaning the fiber; but I have found in practice that the ordinary hatcheling-machines are efficient for this purpose. I then apply as evenly as possible the oil, emulsion, or other lubricant, which is readily absorbed by the clean fiber and its maximum effect insured. For this purpose I prefer to attach to one of

the last preparatory machines in which the hemp is worked before going to the spinners an oil-sprinkler or other suitable device, by means of which the lubricant is evenly and satisfactorily applied.

The advantages obtained by the use of my improved process over those heretofore employed are: first, a saving of oil is effected, since none is wasted in the treatment of the pulp, which is removed before the hemp is in condition to be worked into manufactured articles; second, a fiber is produced which is more pliable and more thoroughly protected against moisture and other atmospheric conditions which tend to attack and destroy it, since the pulpy coating is removed therefrom and the fiber directly brought into contact with and subjected to the treatment of the oil when it is applied; third, a fiber is produced which is cleaner and more perfectly free from foreign matter, since the dry treatment readily removes particles of disintegrated pulp, which would adhere to and fail to be removed from the surface of the fiber in the presence of or when combined with oil; fourth, a saving in labor is effected both in the treatment of the fiber and in working it up into manufactured articles.

It will of course be understood that my invention is not limited in its application to the treatment of sisal-hemp, but may be applied to other analagous fibers under similar conditions.

In their natural state, and especially in the condition in which they are found in plants from which they are obtained, vegetable fibers are generally bound or held together and more or less surrounded or inclosed by resinous, glutinous, pulpy, or woody matter. I am aware that it is not new to treat plants or the fiber-containing portions thereof while in a dry condition by machines operating to remove this matter and to divide and separate the fibers. So far as I am aware, however, this treatment is effected only for the purpose of obtaining the fibers in a form which admits of their subsequent utilization and for the purpose of effecting a subdivision or separation of the fibers from each other. In the practice of my invention, however, the fibers have been reduced to their ultimate fineness before I begin the treatment herein described, the said treatment being adapted for fibers which have previously been separated from each other, but which require further cleaning.

Having described my invention, I claim—

The method, substantially as herein described, of cleaning sisal and analogous fibers and preparing the same for spinning after the ultimate fibers have been separated from each other and the preliminary cleaning effected, which consists in combing or hatcheling said fibers to remove the remaining foreign adhering matter before oil has been applied thereto and of subsequently oiling said fiber.

A. W. MONTGOMERY.

Witnesses:
SAMUEL H. SMITH,
M. J. BURNS.