UNITED STATES PATENT OFFICE.

WILLIAM W. SHARTEL, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO GEORGE B. NICHOLS, OF LOS ANGELES, CALIFORNIA.

PRODUCT FROM THE JOSHUA PALM YUCCA.

1,179,229. Specification of Letters Patent. Patented Apr. 11, 1916.

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To all whom it may concern:

Be it known that I, WILLIAM W. SHARTEL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Product from the Joshua Palm Yucca, of which the following is a specification.

This invention relates to sheet cellulose and process of making same.

The invention relates particularly to the separation of cellulose from the woody trunks, branches, limbs and roots of the yucca, known as the Joshua palm and practically leafless, which is found widely distributed in certain desert areas of North and South America, where it often grows to tree-like dimensions. This growth is in its natural state of little practical use or value, being a poor fuel and with difficulty worked into lumber. It is brash in character and but little has been accomplished in working it up into any practical or utilizable form.

I have determined that by suitable sequence of steps, mechanical and chemical, it is possible to redeem the cellulose of such yucca structures, and to recover it in readily separable sheet form, having the appearance of textile material and capable of use for a great many practical purposes, such as electrical insulation, cloth substitute for clothing purposes and as wall and furniture covering, and as hat stock and the like. The sheets so separated are pure cellulose, all of the unassimilated gums and other substances being entirely eliminated. The sheets so recovered may be worked up for practical uses along the lines above indicated, or may be ground up or reduced to pulp and converted into paper stock or admixed with other substances as may be found desirable in a wide range of arts.

In carrying the invention into practice I first subject the lengths or masses of the yucca growth to a pounding or beating operation which decorticates the limbs, trunks and the like, and tends also to open up the pores of the woody structure. The yucca masses are then boiled in an alkaline solution, such as that of lye or caustic potash, which softens and separates the gums and unassimilated substances so that mechanical treatment of the mass by passing the same through suitable rolls or subjecting the same otherwise to pressure enables these gums and loosened, softened or separated substances to be squeezed out, the cellulose only remaining, and that being thoroughly impregnated or coated with the caustic solution during the previous boiling action. This effectively protects the cellulose from disintegration or decay, and insures a condition of physical stability and permanence. The resultant masses may then be readily reduced to sheet form, the layers or courses, sheets or strips or boards or slabs of cellulose being capable of complete and cleanly divided separation. These subdivisions of cellulose may then be dried, preferably by exposure to the air or sun or both; or, the separation of the layers, sheets, strips or the like may be effected after the drying process instead of before the same. These layers, sheets or the like of cellulose resemble closely in texture loosely woven cloth, and may be stretched out or opened up in mesh as desired, or allowed to remain in a more closely or compactly organized condition. In such sheet form the cellulose in its preserved condition may be worked up as desired in the arts, or may be ground up or reduced to pulp for the making of paper or as a constituent part of various useful products. It will be found that this cellulose is freely combustible, whereas the original yucca stalk surrenders but stubbornly to combustion. The product is pliable and the fibers while not adapted for weaving are not harsh or stiff.

By means of this relatively simple process I am enabled to redeem or derive from what is now a prolific source of unserviceable vegetable growth a highly useful and serviceable product which takes an initial form which adapts the cellulose product to a wide range of uses without any intermediate manufacturing steps, and which may be worked over or combined with other substances or adapted to other conditions of use and service effectively and with ease and economy.

As far as I have been able to ascertain, cellulose in sheet form derived by mechanical and chemical treatment of the woody parts of the yucca limbs, etc., but not the leaves, is an entirely new substance or product, and adds to the arts a valuable source of cellulose supply, veritable forests of this yucca occurring in many districts, where

little else utilizable by man will grow. The intensive cultivation of the yucca in such areas opens up vast possibilities in such regions as the great southwestern desert areas of the United States. Even without such intensive culture, yucca is so prolific in these areas that by practising this invention these hitherto waste lands may be caused to yield great value for the practice and development of the several arts.

It is manifest that the process herein disclosed may be varied considerably without departing from a fair spirit of the invention and without producing results which will be other in general kind than those herein set forth.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. As a new product, cellulose of the yucca in pliable sheet form and with unseparated fibers.

2. As a new product, cellulose of the yucca in pliable sheet form and with unseparated fibers and treated with an alkaline preservative.

3. As a new product, the first mechanically and chemically separated cellulose of the yucca in pliable sheet form and with unseparated fibers.

4. As a new product, cellulose of the trunks, limbs and roots of the Joshua palm yucca growths in pliable and workable sheet form and with unseparated fibers.

5. As a new product, cellulose of the trunks, limbs and roots of the Joshua palm yucca growths in pliable and workable sheet form and with unseparated fibers and devoid of unassimilated gums or the like.

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

WILLIAM W. SHARTEL.

Witnesses:
RAYMOND IVES BLAKESLEE,
FRANCIS L. ISGRIGG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."