

UNITED STATES PATENT OFFICE.

BERTRAND S. SUMMERS, OF PORT HURON, MICHIGAN.

VEGETABLE FIBER.

No. 864,574.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed March 11, 1907. Serial No. 361,737.

To all whom it may concern:

Be it known that I, BERTRAND S. SUMMERS, a citizen of the United States, residing at Port Huron, St. Clair county, Michigan, have invented a certain new and useful Process for the Preparation of Vegetable Fibers, of which the following is a specification.

My invention relates to the preparation of vegetable fibers both for paper making and for spinning-yarns and the like and consists in a new process or method for treating the vegetable fibers whereby a better and more uniform quality of stock results and less waste of material is caused and whereby also the time required for the several operations is considerably reduced as compared with present methods.

My process or method contemplates the employment of the chemical known as calcium chlorid which is a salt extremely soluble in water and for that reason possesses advantages in the practice of my process for reasons hereinafter explained. Moreover, inasmuch as this chemical, which is a very well known article of commerce, is extremely cheap, my process can be economically practiced.

As above stated my invention relates to the treatment and production of vegetable fibers both for paper making and for spinning-yarns and the like and I will now proceed to describe the preferable and recommended processes for these two characters of use which processes differ slightly in details but not in principle as hereinafter made apparent.

Referring first to the practice of my process for preparing paper stock for paper making, I introduce into an ordinary paper-maker's rotary digester the vegetable straw which may be any one of the usual straws used for this purpose such as oat straw, wheat straw, flax straw, etc., and add thereto about one-seventh of its weight of calcium chlorid, together with sufficient water to cover the straw which water in most cases would be about eighty parts by weight. The proportions mentioned are therefore approximately about seven parts of straw, one part of calcium chlorid and eighty parts of water. The straw is then digested for a period of about twelve hours under from forty to fifty pounds steam pressure whereupon the stock is ready to be introduced into the usual and well known beating engines and then prepared in the usual way as is practiced in paper mills.

One of the principal advantages of my method or process, as above described, consists in the fact that the stock is not abraded or roughened but is thoroughly rendered so that when it is introduced into the beating engine it is easily reduced to paper stock. Furthermore, inasmuch as the calcium chlorid is extremely soluble in water very little washing is required to properly prepare the material for the paper or box board with the result that all traces of the chemical are readily and quickly removed. Where a lighter

color is a desideratum it is sometimes further desirable to add to the mixture ordinary lime-water by which I mean water left in contact for some time with quick-lime which has been allowed to settle, thereby overcoming the difficulty experienced in the ordinary rotary treatment for eliminating the last traces of the solid lime. The amount of lime-water is not essential but I have found that one-fourth part by weight of the amount of straw used is a very satisfactory proportion. I have found that where the vegetable straw is treated by the calcium chlorid alone it has a much darker color than when lime-water is present so that in this simple manner I am enabled to obtain a lighter color if the same is desired in the resulting paper stock or product.

Next referring to the method or process for preparing the straw for spinning purposes, the material is digested a shorter time than when intended as a paper stock, usually not more than two or three hours and with a more concentrated solution of the calcium chlorid. Moreover, it is also desirable to employ a stationary vessel instead of a rotary vessel or digester so as to prevent the stock from being tangled which is objectionable in spinning-fibers but not objectionable in paper stock. In the practice of my process for this particular purpose, I prefer to employ about a twenty per cent solution of the calcium chlorid, that is twenty parts of the calcium chlorid to one hundred parts of water, with a pressure from forty to fifty pounds as in the case of the treatment for the production of the paper stock.

While I have given approximately the proportions I prefer to use either in the preparation of spinning-fibers or paper stock, I have found that a wide range of proportions is conducive to good results and that considerable variation of steam pressure may be permitted.

In preparing paper stock I prefer to use wheat straw, oat straw, rye straw and the like but in preparing fibers for spinning purposes, I prefer to employ flax, hemp, jute and the like although for a very rough and weak string it is possible to use some of the materials which are usually used for paper making.

I claim:

1. The process of treating and preparing vegetable fibers or straw which consists in subjecting them to a solution of calcium chlorid; substantially as described.
2. The process of treating and preparing vegetable fibers or straw which consists in subjecting them to a solution of calcium chlorid under pressure.
3. The process of treating and preparing vegetable fibers or straw which consists in digesting or cooking the same with calcium chlorid substantially in the proportions specified, beating the material and washing the same to remove the calcium chlorid; substantially as described.
4. The process of treating and preparing vegetable fibers or straw which consists in subjecting the same to a

solution of calcium chlorid to which has been added a clear solution of lime-water; substantially as described.

5. The process of treating and preparing vegetable fibers or straw which consists in digesting or cooking the same under pressure in a solution of calcium chlorid to which has been added a clear solution of lime-water; substantially as described.

6. The process of treating and preparing vegetable fibers or straw which consists in digesting or cooking the

same under pressure in a solution of calcium chlorid to which has been added a clear solution of lime-water, said straw calcium chlorid and lime-water being used substantially in the proportions herein specified; substantially as described. 10

BERTRAND S. SUMMERS.

Witnesses:

THOMAS Y. WHITE,

MARY RADIGAN.