

UNITED STATES PATENT OFFICE.

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RETTING.

1,235,738.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, BERTRAND S. SUMMERS, a citizen of the United States, residing at Port Huron, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Retting, of which the following is a specification.

My invention relates more particularly to the so-called artificial retting of fibers in which ordinarily heat is employed with or without the addition of chemicals to hasten the action upon the fiber. Artificial retting, as heretofore practised, has never proven a commercial success or a rival to natural retting for the reason that the product of the natural process is superior in that it possesses greater strength and a peculiar oily nature which particularly adapts it to spinning. It is well known that the action of natural retting consists in a fermentation or similar bacterial action upon the pectoses and cutaneous matters by which the fibers are cemented together. The result of the fermentation is a change in the cementing material, such that the fibers may be more readily separated from the wood or ligneous matter, and from each other in the subsequent operations of breaking and scutching. Moreover, in the process of natural retting the fiber loses its raw nature and takes on a soft, flexible, oily character, making it peculiarly adaptable for spinning. In artificial retting, however, as heretofore attempted, the cementing materials have been so severely attacked that while the wood was readily removed, the fiber was left in a condition which is not adapted to commercial spinning. After the flax is cooked under pressure in plain water, both the strength and nature of the resulting fiber are greatly impaired, and when chemicals are added to this water to any considerable amount, this deteriorating effect is much increased.

I have found that the naturally retted fiber is markedly distinguished from artificially retted fiber in that a large proportion of the pectose substances are retained therein. In the chemical process heretofore employed for artificial retting a large proportion of the pectose and other cementing substances is removed. I have discovered that the presence of certain bodies in the aqueous bath retard or prevent the deleterious effect of artificial retting upon the fiber and that if the chemicals used in retting

these soluble bodies are sufficiently low in amount, no deleterious effect whatever is noticeable. My improved process is based upon the discovery that if albuminous material is rendered soluble and introduced into the aqueous retting bath, the pectose material retained in the fiber is about equal to that retained during the natural retting process, and the albuminous material has apparently the property of combining with the fiber, and imparting to it excellent spinning qualities, known as nature.

My process is therefore characterized by the fact that I introduce material into the fibrous substance rather than deprive it of material and by the fact that I seek to retain in the fiber as much of the pectose substance as possible, the real retting agency being albuminoids which do not attack the fibrous substance, but impart to it additional beneficial qualities.

The albuminoid which I prefer to employ is either casein or dégras. The latter is a mixture of albuminoid and oily substances resulting from the oil tanning of leather. In that operation the leather is impregnated with a suitable oil, usually fish oil, and hung up to dry until the oil oxidizes. This operation is repeated several times after which the hide is placed in boiling water and the excess fatty and albuminous material removed, which material is the dégras referred to above. Either casein or dégras may be used singly but preferably I employ a mixture of the two which may contain any proportions desired but preferably about equal quantities of each. Whatever albuminoid or mixture of albuminoid is used is dissolved in water by means of a suitable solvent, preferably sulfid of soda. To make the solution I use from one to three pounds of the sulfid of soda, dissolve the same in water and add thereto five to ten pounds of albuminoids. In order to effect the solution the sulfid of soda is first added to water and the solution stirred and heated when the albuminoids may be added thereto and readily dissolved. The dissolved albuminoids are then added to the bath in which the flax is to be cooked and is sufficient for twenty-five hundred or three thousand pounds of straw.

This and the other steps of my process may be carried out in a variety of apparatus; for example, I may employ a digester holding from twenty-five hundred to three

thousand pounds of flax straw. The material is neatly laid in the vessel or digester and a suitable amount of water, which is preferably insufficient to cover the mass, is introduced. The above solution of albuminoid in water is then turned into the digester and the latter sealed. Live steam is then introduced into the mass and the liquor in the digester caused to circulate during the cooking. The pressure is raised to from fifty to seventy pounds per square inch and the cooking continued from one to two hours. After the material has been sufficiently cooked the liquor is blown off preferably into a retaining tank.

The next step in the treatment is the introduction of wash water into the materials in the digester, which water contains a suitable oxidizing agent, preferably bleaching powder. The precise amount of this material is not essential but it is satisfactory to add about five pounds of bleaching powder to the contents of the digester. The treatment with the oxidizing agent has the effect, among others, of precipitating any albuminous material which remains in the fiber in a soluble condition. The treatment with the oxidizing solution or wash may be continued for from twenty minutes to an hour when the wash-water is run off and the material is ready for drying and mechanical treatment. For the sake of economy I may run the retting solution into a retaining tank after each cook so that it can be used again by simply adding the same amount of albuminoid solution as above described at the standing bath. The effect of the addition of the albuminoid to the retting solution seems to be not only to introduce a portion thereof into the fibrous material but by decreasing the avidity of the retting solution for the pectose material retains a larger percentage of the latter in the fiber. While I have described in detail a preferred method of carrying out my invention, it is to be understood that the purpose of the description is exemplification only and that the scope of the invention is defined in the following claims in which I have endeavored to distinguish it from the

prior art so far as known to me, without, however, abandoning or relinquishing any portion or feature thereof.

I claim:

1. The process of retting fibrous materials which consists in subjecting them to a bath of albuminous material under high heat and pressure.

2. The process of impregnating fibers to be treated with albuminous material which consists in dissolving said material, treating the fibers with the solution and then precipitating the albuminous material within the fibers.

3. The herein described method of retting which consists in forming a bath by dissolving albuminous material in a solution of sulfid of soda, treating the fibers to be retted with the solution and then precipitating the albuminous material in the fibers.

4. The herein described method of retting fibrous material which consists in dissolving albuminous material in a solution of sulfid of soda, treating the fibers to be retted with the solution and then oxidizing whereby any dissolved material within the fibers is precipitated.

5. The herein described method of retting fibrous material which consists in forming a retting solution by dissolving albuminous material in sulfid of soda solution, treating the fiber to be retted with the solution, withdrawing said solution and treating the fiber with a solution of bleaching powder.

6. The herein described method of retting flax which consists in subjecting it to a solution of albuminous material under high heat and pressure and then treating the product with an oxidizing agent.

7. The herein described process of retting fiber which consists in forming a solution of casein by treating the same with sulfid of soda, subjecting the fiber to the bath so formed and then washing the fiber with a bath containing an oxidizing agent.

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Witnesses:

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