

UNITED STATES PATENT OFFICE.

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METHOD OF PRODUCING A COTTON SUBSTITUTE FROM RAMIE.

1,004,974.

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, PIERRE BIRKENSTOCK, citizen of France, residing at 33 Rue de Bordeaux, L'Arbresle, Rhône, in the Republic of France, have invented new and useful Improvements in the Method of Producing a Cotton Substitute from Ramie, of which the following is a specification.

My invention relates to the treatment of decorticated ramie fibers and has for its object to reduce to a batting the raw ramie fibers by a chemical treatment and to obtain with said batting threads capable of being substituted for cotton threads. The fibers in said batting have the same length, fineness, curliness and appearance as cotton batting and the cost price thereof is much under that of the latter. The thread obtained by spinning the ramie batting above mentioned has exactly the same appearance, softness and elasticity as cotton thread and a much higher strength.

Another object of my invention is to provide a batting which may be easily obtained at home in any desired quantity and permits of manufacturing threads with the same machinery as for cotton spinning, the preparation of the fibers necessitating only a few special machines which are simple and inexpensive.

One feature of my improved method is that the ramie instead of being treated in view of obtaining ramie thread proper is altered by chemical means into a curled fine flexible and homogeneous batting from which a thread is obtainable which has all the appearance and also all the properties of cotton thread, with a much higher strength. If ramie thread proper is to be obtained, numerous costly and complicated operations are necessary, such as a repeated combing which results into a large waste and a net cost price absolutely impracticable so far as cheap fabrics similar to calico and the like are concerned. On the other hand, ramie thread cannot be obtained by spinning in the form of a batting but as long fibers. Said thread is rigid, irregular and entirely deprived of elasticity and suppleness.

According to my invention, combing with its drawbacks is entirely done away with, the

material being treated under a raw state and chemically reduced into batting so that waste is reduced to a minimum. The fibers may be given any desired lengths by cutting the same in an adjustable cutting machine having a great output, such as 3,000 kilograms per day and delivering the fibers at the exact length very regularly.

My method may be embodied as follows, the numbers cited being only indicated by way of example:

A. 5 liters of sulforicinate of soda at 50% are poured into 1,000 liters cold water and mixed therewith. 20 liters caustic soda at 36° Baumé are then added and mixed. 5 kilograms carbonate of soda Solvay are dissolved into 20 liters boiling water and added to the above solution and 50 kilograms of raw decorticated ramie in plats are then placed into the bath which is caused to boil for eight hours. The bath is then drawn off while cold water is run onto the material until it remains clear when leaving the same. The material is then washed in cold water containing 1% chlorhydric or sulfuric acid, where it is left for one hour. The material is then washed down in pure running cold water and dried in a drying machine. For preventing the ramie plats of becoming entangled together in the boiling bath, they may be bound together in bundles of 15 to 20 plats by means of cords or placed into metallic cages or any other device whereby the plats are maintained separate and may be thereafter tendered to the cutting machine as little distorted as possible for the sake of regularity in cutting the fibers.

B. The ramie plats, treated as above being dried, are run through a breaking and beating machine as many times as necessary for obtaining fibers having a great suppleness, such machines being well known.

C. The ramie plats being rendered supple and flexible are cut in a cutting machine into lumps of fibers of any desired length, said lumps are thereafter treated in a breaking card with middle sized teeth for separating one from each other the fibers agglutinated together, the fibers are then removed to a card with finer and closer teeth for obtaining a thorough division of said

fibers. The results in spinning depend essentially upon a good separation of the fibers. Said fibers are then brought to the opening machine.

5 D. The fibers (50 kilograms) delivered by the opening machine are placed into a bath or "curling bath" of the following composition: Into 500 liters pure cold water (distilled if possible or at least containing 10 no limestone) are poured 2 liters sulforicinate of soda at 50% which are mixed therewith. 500 liters caustic soda at 36° Baumé are then added and mixed. The fibers are placed into said bath and left therefor one 15 hour. Provision is made for stirring the same continuously by means of wood shovels or forks so that all particles of fibers may be attained by the liquid and the fibers on the top of the bath get at the bottom and 20 vice versa. The fibers are then dried in a centrifugal machine which should be in close proximity to the bath. As the fibers are dried they are put into a bath containing 1,000 liters cold water with 10 liters chlor- 25 hydric acid and washed therein while continuously stirred. The fibers are then briskly removed from the bath and washed down in cold, pure running water. This washing should be very thoroughly ef- 30 fected. It should especially be borne in mind that the fibers when taken out from the acidulated bath should not be left to themselves. They should be immediately washed in cold running water and then 35 dried in a centrifugal machine. The batting thus obtained is thereafter thoroughly dried in a drying apparatus.

The soda or curling bath waste left in the centrifugal machine and the liquid left in 40 the receptacle used for curling the batting are preserved for use in following operations. One may be surprised by the comparatively high proportion of caustic soda used in said curling bath with regard to the small 45 amount of material to be treated. This however does not increase in any way the cost of manufacture as the same bath may be used four or five times for treating new amounts of material provided care is taken 50 in recuperating the waste and the liquid left as just above described.

The above step consisting in soaking the fibers in the curling bath is the most impor- 55 tant of the process. It results in curling the fibers so that they may be fed in the required manner in spinning and carding operations and giving the thread the elasticity desired, while reducing the fibers to the necessary degree of thinness. The batting being 60 dried is again run through a card with middle sized teeth for opening and equalizing the lumps formed in the curling bath, and then brought to the spreading or lap machine; it is thereafter run through the 65 finishing card whereupon it is ready for

spinning which is effected as in the case of cotton batting and with the same machinery. The yarn obtained will then be bleached and boiled in a solution containing 600 grams 70 pasty soap in 100 liters water. The men attending to the treatment in the curling bath will be provided with rubber gloves. The above mentioned proportions and amounts may be varied within certain limits without departing from the scope of my invention. 75

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A method for obtaining batting and yarn as a substitute for cotton consisting in 80 treating the raw decorticated ramie in a bath containing caustic soda, carbonate of soda and sulforicinate of soda, washing the same in acidulated cold water and then in pure cold water, drying the same, breaking 85 and beating the material for giving the fibers suppleness, cutting the material to the length desired, separating the fibers, curling the batting so obtained by treating the same in a cold water bath containing 90 caustic soda and sulforicinate of soda, drying the material, washing the same in acidulated cold water, then in pure cold water, drying the same, separating, spreading and finishing the dried batting; and spinning 95 the same as in the case of cotton batting, substantially as described and for the purpose set forth.

2. A method for obtaining batting and yarn as a substitute for cotton, consisting in 100 mixing 5 liters sulforicinate of soda with 1,000 liters cold water, adding 20 liters caustic soda at 36° B., dissolving 5 kilograms carbonate of soda in 20 liters boiling water, adding said latter solution to the 105 former, placing 50 kilograms raw decorticated ramie into the bath thus obtained, boiling the same, drawing off the bath while running cold water onto the material until said water be clear when leaving the mate- 110 rial, washing the material first in cold water containing 1% chlorhydric or sulfuric acid, soaking the material in said acidulated water, washing thoroughly in pure running cold water, drying the material, 115 breaking and beating the material as many times as necessary for giving the fibers suppleness, cutting the plats into lumps of the desired length, separating the fibers of the lumps; placing 50 kilograms of fibers when 120 leaving the opening machine into a curling bath composed of 500 liters pure cold water, 2 liters sulforicinate of soda at 50% and 500 liters caustic soda at 50° B., soaking and stirring the fibers in said bath, drying 125 the fibers, washing and stirring the same in a bath containing 1,000 liters cold water with 10 liters chlorhydric acid, removing briskly the fibers from the bath, washing them immediately in pure running cold wa- 130

ter and drying them; separating, spreading
and finishing the dried batting thus ob-
tained; spinning the material, bleaching the
yarn obtained and boiling the same in a
5 solution containing 600 grams pasty soap in
100 liters water, substantially as described
and for the purpose set forth.

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

PIERRE BIRKENSTOCK.

Witnesses:

DENIS GILLET,
MARIN VACHOY.