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3,116,968

METHOD FOR PREPARING AND CHEMICALLY BOILING OFF THE  
GUM OF RETTED FLAX TO ALLOW ITS READY SPINNING

Filed May 25, 1960

2 Sheets-Sheet 1

## PECTOSE AND GUM REMOVAL TREATMENT

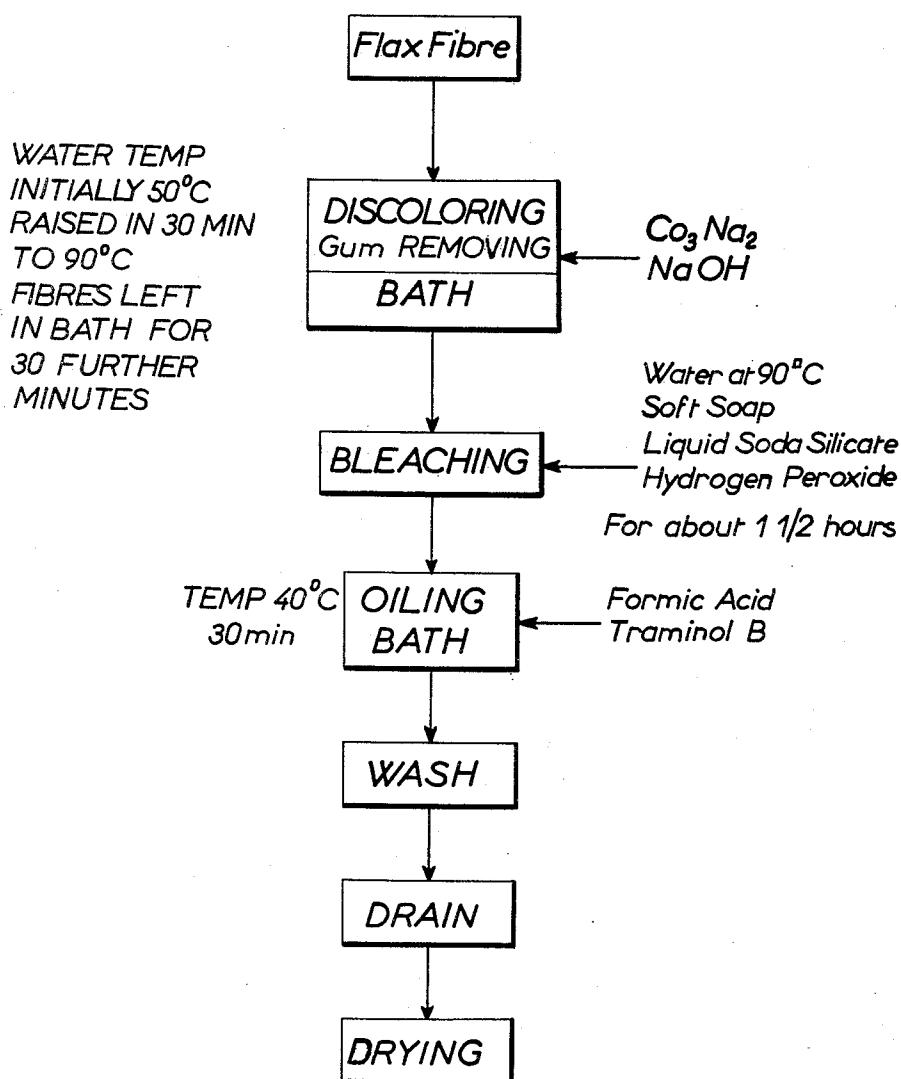


Fig. 1

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## DRY TREATMENT

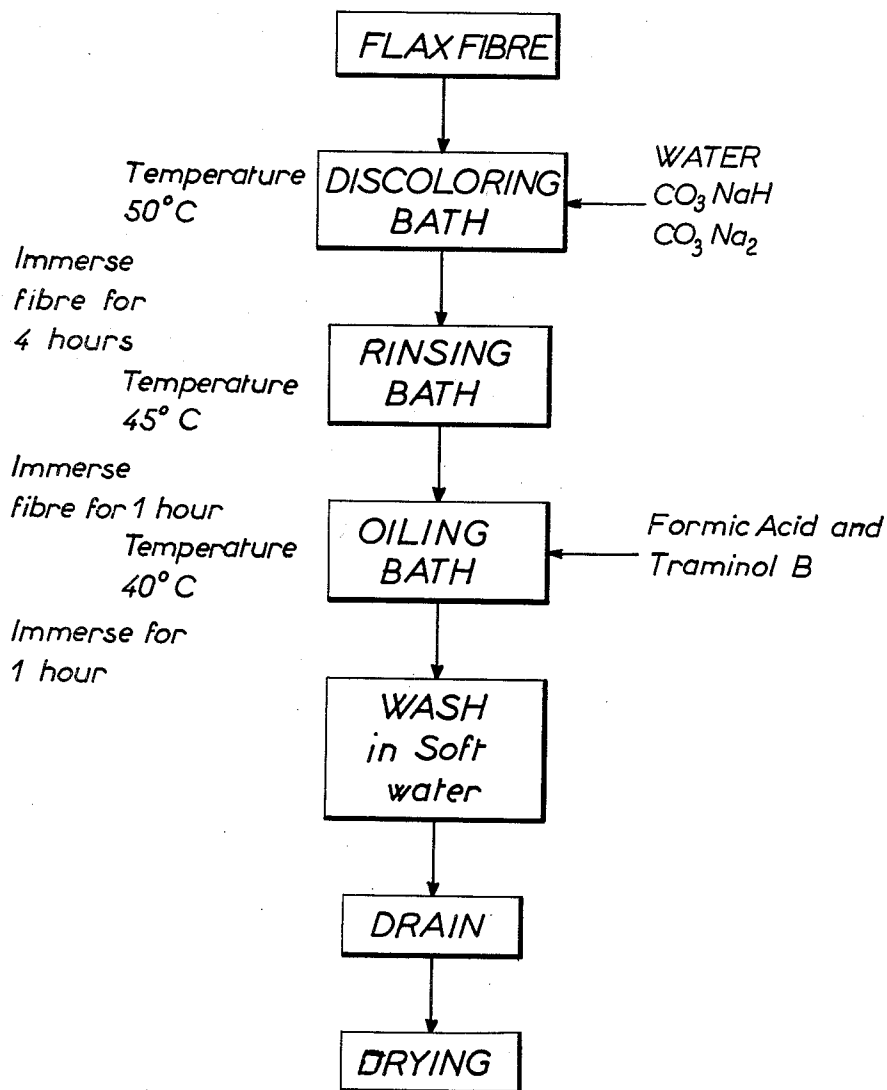


Fig. 2

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## METHOD FOR PREPARING AND CHEMICALLY BOILING OFF THE GUM OF RETTED FLAX TO ALLOW ITS READY SPINNING

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3 Claims. (Cl. 8—139)

This invention relates to methods for preparing retted fibres.

An object of the invention is to provide an improved method for preparing retted flax and removing chemically its gum, said method being effected with or without a final bleaching operation according to the final application intended for the ultimate thread.

Textile flax fibres are well known, both as to their origin and as to the various treatments and applications thereof. With respect to said treatments, it is desired to stress the fact that flax fibres intended for treatment in spinning frames should be previously freed of dust and reduced cross-sectionally so that they may be used, after chemical treatment, on a selected spinning frame. This corresponds primarily to a physical preparation of the material, which should be effected in a very careful manner.

The fibres are then treated chemically in accordance with a method which forms the object of the invention, the process differing according to whether it is desired to retain the appearance, feel and colour of flax, which requires a dry treatment, or whether it is desired to remove from the fibres the pectoses and the gums binding the fibrillae to provide the fibres with suitable elastic and water-absorbing properties.

The accompanying drawing diagrammatically illustrates both of the methods according to the invention.

We will describe a method for the dry treatment of the retted flax fibres, with a view to making said fibres retain their natural structure and original color, after they have been retted in a bacterial bath.

Generally speaking, and without this forming a limitation of our invention, we use for each 100 kgs. of fibres to be treated, a container or a vat of a commercial type, which may be readily heated and which is equipped with a steam input, with an input of running water and also with means for controlling the draining or exhaust of the vat. The latter may have a capacity of about 2,000 litres. The weight ratio between the material and the bath is thus equal to  $\frac{1}{20}$ . The method referred to is as follows:

(I) Treatment of the fibres in a discolouring bath constituted by soft water.

Said bath is obtained by dissolving in water 1 gr. per litre of soda bicarbonate  $\text{CO}_2\text{NaH}$  and 3 grs. per litre of neutral soda carbonate  $\text{CO}_3\text{Na}_2$ . The bath is heated to a temperature of  $50^\circ\text{C}$ . and the fibres are then immersed for 4 hours under intermittent stirring conditions.

(II) Treatment of the fibres in a rinsing bath.

The fibres are immersed in water at a temperature of  $45^\circ\text{C}$ . for 1 hour under intermittent stirring conditions.

(III) Treatment in an oiling bath.

We prepare a solution at  $40^\circ\text{C}$ . of 40 centilitres of formic acid for each 100 kgs. of material to be treated and of 0.5 gr. of a commercially available soluble oiling oil of paraffin oil base or like self-emulsifying oiling products.

This bath is continued for 1 hour under intermittent stirring conditions.

(IV) Two washing operations are then performed in soft water.

(V) The fibres are subjected to a draining after said washing operations.

(VI) We proceed finally to a drying at a temperature

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of  $60^\circ\text{C}$ . at a maximum or in the open. When drying at a raised temperature, the latter should not exceed the figure given, so as to avoid any possible damage to the fibres.

It is then possible, if desired, to open the fibres over a beater.

We will now describe a second method adapted to produce a treatment removing the gum, followed by a bleaching or otherwise, with a view to obtaining fibres which are entirely devoid of gums binding together the fibrillae. Such fibres are used in various spinning frames, either alone or in admixture with other vegetable, animal, artificial and/or synthetic fibres.

According to said second method, we may resort to a vat of a commercial type having the above-disclosed aperturances and the capacity of which, in particular, provides a bath weighing twenty times the material treated therein. This second *modus operandi* is then as follows:

(I) Treatment of the fibres in a discolouring gum-removing bath constituted by soft water.

There is introduced into said bath constituted by running water, the temperature of which is  $50^\circ\text{C}$ . at the start, 1 gr. per litre of bicarbonate of soda  $\text{CO}_2\text{Na}_2$  and liquid caustic soda  $\text{NaOH}$  at  $30^\circ\text{Bé}$ . at the rate of 10 litres per 1,000 litres of water. The temperature is raised during a period of 30 minutes up to  $90^\circ\text{C}$ . and the fibres are left in the bath during 30 further minutes at said temperature, after which the bath is drained off.

(II) The fibres are treated in a bleaching bath and to this end, there is introduced into the same vat, without any rinsing, water heated to a temperature of  $90^\circ\text{C}$ . We then mix together 1 kg. of soft soap for each 1,000 litres of water with 1.5 litres of liquid soda silicate, for each 1,000 litres of water and we added peroxide of hydrogen at 130 volumes at the moment of the boiling at the rate of 5 litres of peroxide of hydrogen for every 1,000 litres of water. In case of overflow, the level of the bath with the material immersed therein is maintained at the desired level through the incorporation of water at the same temperature of  $80^\circ\text{C}$ . The duration of the actual bleaching treatment is about  $1\frac{1}{2}$  hours.

(III) Treatment in the oiling bath.

The fibres are rinsed at  $40^\circ\text{C}$ . for 30 minutes with a mixture of 10 centilitres of formic acid and 1 litre of the aforesaid oiling product, for each 100 kgs. of flax material to be treated.

(IV) We proceed with two washing operations with soft water.

(V) The fibres are subjected to a draining after the washing operations.

(VI) Lastly, the drying is effected at a temperature of  $60^\circ\text{C}$ . at a maximum or in the open.

It is also advantageous, if required, to finally open the material on a suitable beater.

According to a modification, the first treating operation of the fibres in a discolouring and gum-removing bath constituted by soft water, may be effected in running water having at the start a temperature of  $50^\circ\text{C}$ . and containing 1 gr. of bicarbonate of soda ( $\text{CO}_3\text{HNa}$ ) at the rate of 1 gr. per litre and liquid caustic soda at  $36^\circ\text{Bé}$ . at the rate of 10 litres per 1,000 litres of water.

Furthermore, within the scope of our invention as defined by the accompanying claims, the method described and its modifications are applicable to green flax obtained directly from the ripe crop when the seeds may be separated from the stalks.

Before treating such green flax according to our invention, it should be subjected to the conventional cleaning i.e. the seeds should be separated from the stalks, after which a conventional stripping is performed to separate the straw from the actual fibres. Said treatment is operated in a suitable medium. The fibres are then subdivided longitudinally according to their intended application, after

which they are opened by any machine which may serve for said purpose.

The fibres appear then in the form of flax waste, or else, as a continuous material in the shape of an untwisted cord and it is subjected to any of the above-mentioned treatments.

Under similar conditions, the method according to our invention is applicable to China grass and to hemp, after said materials have been suitably treated to form scurf-free strips.

What we claim is:

1. A method for preparing retted fibres comprising immersing about one part of said fibres in about twenty parts of a discoloring bath at a temperature of about 50° C. for about four hours, said bath being prepared by dissolving soda bicarbonate and neutral soda carbonate in soft water, rinsing said fibres in water at about 45° C. for about an hour with stirring, immersing said fibres in an oil bath prepared by dissolving a soluble oiling oil in formic acid, draining the oiling bath from the fibres, and drying the fibres.

2. A method for preparing retted fibres comprising immersing about one part of said fibres in about twenty parts

of a discoloring bath at an initial temperature of about 50° C., the bath being prepared by dissolving bicarbonate of soda and liquid caustic soda in soft water, raising the temperature of the bath to about 90° C. in about thirty minutes, leaving the fibres in said bath for about another thirty minutes, draining off said bath, treating the fibres in a bleaching bath consisting of a mixture of soft soap and liquid soda silicate to which is added peroxide of hydrogen when the mixture is boiled, treating the fibres in an oiling bath consisting of soluble oiling oil dissolved in formic acid, and washing, draining and drying the fibres.

3. A method of preparing retted fibres comprising treating one part of said fibres in about twenty parts of a discoloring bath at a temperature of at least 50° C. and then treating the fibres in an oiling bath prepared by dissolving a soluble oiling oil in formic acid.

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