Oct. 28, 1930. B. G. H. VAN DER JAGT 1,779,505

PREPARATION OF COCONUT FIBERS FOR SPINNING AND WEAVING

Filed Dec. 1, 1928 2 Sheets-Sheet 1

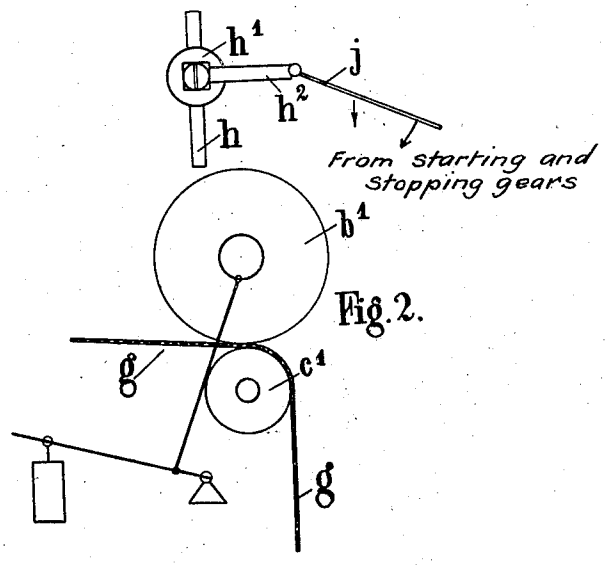


Fig. 2.

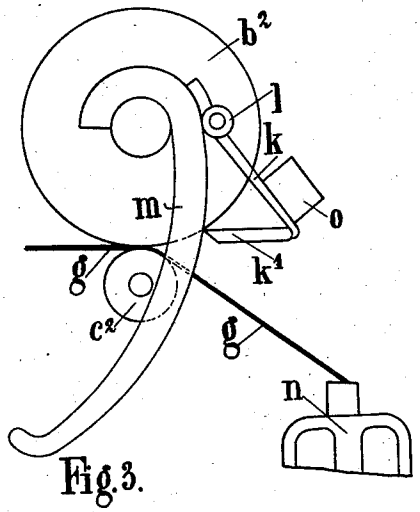


Fig. 3.

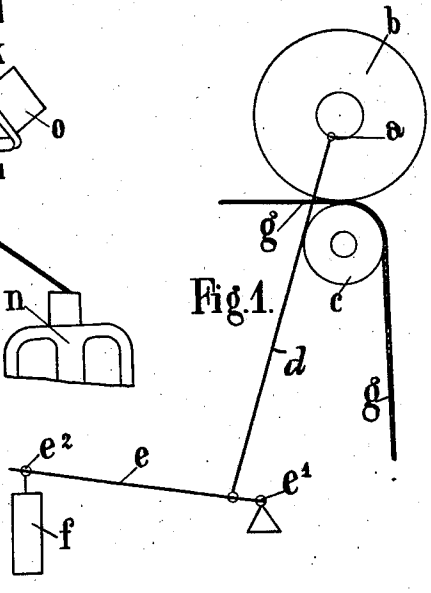


Fig. 1.

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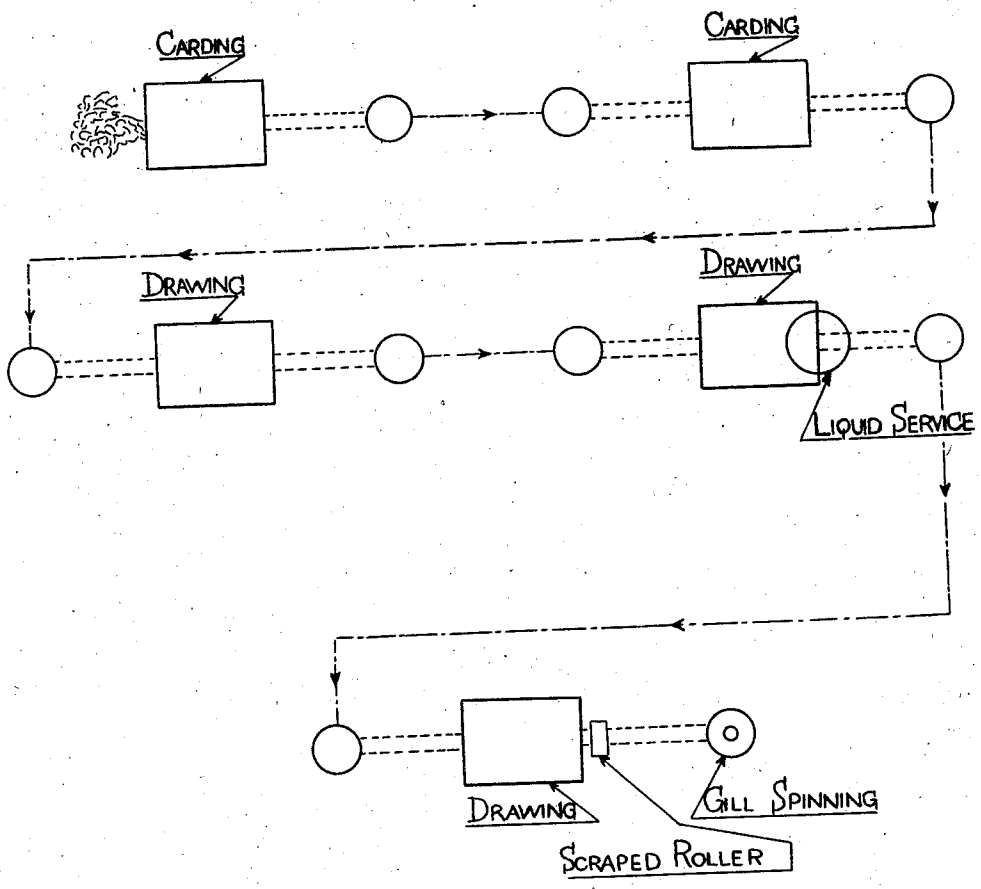


Fig. 4.

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Patented Oct. 28, 1930 1,779,505

UNITED STATES PATENT OFFICE

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PREPARATION OF COCONUT FIBERS FOR SPINNING AND WEAVING

Application filed December 1, 1928, Serial No. 323,180, and in Great Britain December 5, 1927.

This invention relates to the spinning or other manipulation of coconut fibers for the production of yarn or other products therefrom.

In British Patent No. 246,837 the advantages of flattening the fiber while in a moist condition are referred to and it is shown how this is done by increasing the pressure between the feed rollers of a common spinning machine or by providing a special pair of rollers for this purpose.

For successfully carrying out the flattening a moisture content of not less than some 50 per cent. was found to be necessary but, when working fiber in this condition over the card and drawing frames and the gill spinner, difficulty was experienced because the fiber tended to lick on the drawing rollers. On the other hand if the moisture was low, say 25 per cent., it was impossible to make sliver which would stand up at the drawing frames and gill spinners.

The object of the present invention is to overcome the foregoing difficulties and to provide improvements in the manipulation of coconut fiber.

The invention consists in a method of utilizing coconut fiber for spinning according to which the fiber is worked in a normally dry condition over the preparing machinery and is moistened to the desired extent just before spinning.

The invention further consists in a method according to the preceding paragraph or apparatus for carrying the same into effect in which cast iron or like rollers provided with scrapers are employed for the drawing rollers of the gill-spinning frame to facilitate the spinning of the fiber in a moist condition or if desired with the addition of starch water thereto.

The invention further consists in a method and/or apparatus according to either of the preceding paragraphs in which the sliver is subjected to a heavy pressure amounting, say, to about ten times the normal pressure in a card or drawing frame delivery roller.

The invention further consists in apparatus for spinning fiber in a moist condition in which means operating the starting device of a drawing frame also controls a service of starch water or other liquid to the delivery roller of said frame while said roller is arranged to exert a heavy pressure on the sliver.

The invention further consists in apparatus for spinning fiber in which a drawing roller of a gill-spinning frame is provided with a gravity controlled scraper fitted to the means which exert pressure on the roller so that the scraper follows the movements of the roller.

The invention also consists in improvements in or relating to the utilization of coconut fibers as hereinafter described.

Referring now to the accompanying diagrammatic drawings:—

Figure 1 indicates a way of subjecting the sliver to a heavy and adjustable pressure at the delivery rollers of preparing machinery such as cards and drawing frames;

Figure 2 shows an arrangement for moistening the sliver at the last delivery rollers before passing to a gill-spinning frame or the like;

Figure 3 shows a roller for example of cast iron and fitted with automatic scraper means for passing the sliver into the gill spinner.

Figure 4 is a smaller scale diagram showing the parts of the apparatus in relation to one another.

In carrying the invention into effect in one convenient form the fiber obtained from the coconuts, for example as described in American Patent No. 1,713,681, is worked over for example the carding machinery p, p' and drawing frames r, r' shown in Fig. 4 in an air-dried condition or say not exceeding in the neighbourhood of 25 per cent. total moisture and at the delivery rollers of the said carding machines and drawing frames the sliver is subjected to a heavy pressure which will be not less than three times and preferably in the neighbourhood of ten times the pressure usually employed in such appliances.

Figure 1 is a diagram indicating how this pressure may be applied in any of the said apparatus by connecting the frame indicated at a of one of a pair of delivery rollers b, c of a carding machine drawing frame or the like by means of tension members or the

like d to levers e which are pivoted at the end e' closely adjacent to the point where the tension member d is connected thereto and are provided at the other end e^2 at a considerably greater distance from the tension member d with a weight f which may be adjustable as to amount and/or position along the lever e and by means of which the pressure between the rollers b, c may be adjusted.

The material after its passage through say a breaking and a finishing carding machine p and p' in the form of a sliver g may be passed through a series of, any desired number of drawing frames rr', being subjected to abnormal pressure at the delivery rollers of each of the machines in the manner already indicated. At the delivery roller of the last drawing frame for example r' and immediately before passing to the gill-spinning frame s the sliver is subjected to a moistening process, this being conveniently accomplished as indicated in detail in Figure 2 by fitting for example a starch water service h to deliver on to the roller b' and controlling the service by means of a valve h' the handle h^2 of which is connected to the starting mechanism of the drawing frame for example by a rod j in such a manner that when the machine is started the valve h' is opened and the starch water fed to the sliver g while when the machine is stopped the liquid service is automatically turned off by the act of stopping.

Figure 3 indicates means for passing the moistened sliver of fiber g to the gill-spinning frame s; the drawing roller of this apparatus is constructed of cast iron or similar material and the roller is provided with automatic scrapers for clearing the sliver therefrom.

The scrapers k may be conveniently hinged to the bearing members for the rollers by connecting them, say, to the members m which apply the necessary pressure to the rollers b^2, c^2. The scraper k may consist of a suitable knife or the like which may be formed of brass or other suitable material occupying a more or less horizontal position at k' closely adjacent to the region where the sliver leaves the rolls to enter the flier and spinning spindle n and this knife member may be suitably connected by inclined arms k to a pivotal hinge l upon the bearing, m, say on a horizontal line from the centre of the roller axis, the scraper being suitably loaded, say by a weight o, so that it is maintained in contact with the roller b^2 by gravity.

By operating as above described it is possible to successfully card and draw the fiber in an air-dried condition without any tendency for it to lick upon the rollers due to the dry condition. At the same time the spinning in a moist condition or with the application of starch water facilitates the production of a much stronger yarn such as may be employed for many purposes for which coconut fiber is not at present suitable.

Although in the foregoing description the pressure on the slivers has been indicated as applied by a weight and levers, it is to be understood that this is only given by way of example and that springs, screws or other suitable devices may be employed for exerting the necessary pressure.

It is to be understood that the construction and apparatus described is given by way of example only and that modification and additions may be introduced without in any way departing from the spirit of this invention.

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

1. A method of spinning coconut fiber comprising subjecting working the fiber in an air-dried condition to preparatory carding and drawing operations with abnormally high pressure on the resulting slivers adding liquid to the sliver and subjecting the wet sliver to a gill-spinning operation.

2. Apparatus for spinning coconut fiber comprising preparing machines including drawing frames over all of which the fiber is worked in an air-dried condition, means for subjecting the resulting slivers to abnormal high pressure in the delivery rollers of each machine, means for adding liquid to the sliver at the delivery rollers of the last drawing frame and means for subjecting the wet sliver to a gill-spinning operation.

3. Apparatus for spinning coconut fiber comprising preparing machines including drawing frames over all of which the fiber is worked in an air-dried condition, means for subjecting the resulting slivers to abnormal high pressure in the delivery rollers of each machine, means for adding starch water to the sliver at the delivery rollers of the last drawing frame, a gill-spinning frame for receiving the wet sliver, drawing rollers of hard material such as cast iron for said spinning frame and resilient scraping means for said hard rollers.

4. Apparatus for spinning coconut fiber comprising carding machines and drawing frames over which the fiber is worked in an air-dried condition, means for loading the delivery rollers of each machine to subject the resulting slivers to abnormally high pressure, a liquid service fitted to the delivery rollers of the last drawing frame for moistening the sliver, a gill-spinning frame over which the wet sliver is worked, cast iron rollers for said gill spinner and scraping means fitted to said rollers.

5. Apparatus for spinning coconut fiber comprising carding machines and drawing frames over which the fiber is worked in an air-dried condition, means for loading the delivery rollers of each machine to subject

the resulting slivers to abnormally high pressure, a liquid service fitted to the delivery rollers of the last drawing frame for moistening the sliver, a gill-spinning frame over which the wet sliver is worked, cast iron rollers for said gill spinner, means for exerting a high pressure on said cast iron rollers and a gravity controlled scraper fitted to the pressure exerting means so that the scraper follows the movements of the rollers.

6. Apparatus for spinning coconut fiber comprising preparing machines including drawing frames over all of which the fiber is worked in an air-dried condition, means for subjecting the resulting slivers to abnormal high pressure in the delivery rollers of each machine, means for adding liquid to the sliver at the delivery rollers of the last drawing frame, a gill-spinning frame over which the wet sliver is worked, cast iron rollers for said gill spinner, means for exerting a high pressure on said cast iron rollers and a resiliently controlled scraper fitted to said rollers.

7. Apparatus for spinning coconut fiber comprising preparing machines including drawing frames over all of which the fiber is worked in and air-dried condition, means for subjecting the resulting slivers to abnormal high pressure up to about ten times that usually employed in the delivery rollers of each machine, means for adding liquid to the sliver at the delivery rollers of the last drawing frame, a gill-spinning frame over which the wet sliver is worked, cast iron rollers for said gill spinner, means for exerting a high pressure up to about ten times that usually employed on said cast iron rollers and a resiliently controlled scraper fitted to said rollers.

8. Apparatus for spinning coconut fiber comprising carding machines and drawing frames over which the fiber is worked in an air-dried condition and with an abnormally high pressure up to about ten times that usually employed exerted on the resulting slivers in the delivery rollers of each machine, a starch water service to wet the sliver fitted to the delivery rollers of the last drawing frame and regulated by the starting and stopping mechanism thereof, a gill-spinning frame over which the wet sliver is worked, cast iron rollers for said gill-spinning frame, means for loading said cast iron rollers to subject the sliver to an abnormally high pressure up to about ten times that usually employed and a resiliently controlled scraper fitted to the loading means so that the scraper follows the movements of the rollers.

9. A method of spinning coconut fiber comprising subjecting the fiber in an air-dried condition to preparatory carding and drawing operations with abnormally high pressure of not less than three and up to about ten times that usually employed on the resulting slivers, adding liquid to the sliver and subjecting the wet sliver to a gill-spinning operation.

10. A method of spinning coconut fiber comprising subjecting the fiber when containing not more than some 25 per cent., of moisture to preparatory working, subjecting the resulting slivers to not less than three and up to ten times the pressure normally employed, moistening the sliver to a liquid content of not less than 25 per cent. and up to 50 per cent., or more and subjecting the wet sliver to a gill-spinning operation.

11. A method of spinning coconut fiber comprising subjecting the fiber when containing not more than some 25 per cent. of moisture to preparatory carding and drawing operations with pressures of not less than three and up to ten times the pressure normally employed on the resulting slivers, adding starch water to the sliver, heavily pressing the sliver with cleanly scraped hard close grained surfaces and subjecting the wet sliver to a gill-spinning operation.

12. A method of spinning coconut fiber comprising subjecting the fiber to preparatory working in an air-dried condition, subjecting the resulting slivers to abnormally high pressure, adding starch water to the sliver, heavily pressing the sliver with cleanly scraped hard close grained surfaces and subjecting the wet sliver to a gill-spinning operation.

In testimony whereof I have signed my name to this specification.

BAREND GYSBERTUS HENDRIKUS van der JAGT.