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RAYON FIBER AND METHOD OF TREATING THE SAME

Gustav Jean Nord, Gastonia, N. C.

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My invention relates to new and useful improvements in synthetic fibers, and particularly to the method of making the same. The fiber is made up either from "Rayon" waste, or "Rayon" staple fiber, which latter is, of course, formed by cutting the "Rayon" thread into short pieces, after which either the "Rayon" waste or staple fibers or a blend of them are to be treated, as will be hereinafter more fully explained.

Another object of the invention is to produce a "Rayon" staple that afterwards may be made up into yarns or fabrics, may be processed on the standard equipment of cotton, woolen or worsted mills, and may be made up into upholstery fabrics, fabrics for suiting, knit goods, dress goods, draperies, and felts; in fact, into many forms of fabrics of similar nature and uses.

Still another object of the invention is to treat the fiber or waste with mechanical agitation after certain oils and salts have been thoroughly mixed with the waste, so that the fibers will become very fluffy after the same have been put through the fluffing machine and the individual fibers thoroughly shrunk and kinked similarly to raw wool or cotton.

Still another object of the invention is to produce a synthetic fiber that is to be treated, as hereinafter set forth, so that the subsequent carding and printing qualities, as well as the dyeing and fulling properties, will be greatly improved.

Still another object of the invention is to so treat the fibers that they will take the twist faster than wool or cotton and produce a strong elastic and flexible yarn which can be run at a high rate of speed.

With these and other objects in view, the invention consists in certain new and novel arrangements and combination of parts, as will be hereinafter more fully described and pointed out in the claims.

As is well known, "Rayon" is of four general classes, but the present invention has to do primarily with the "Rayon" made by the viscose and/or cuprammonium process, as these classes produce about seventy-six per cent of all the "Rayon" in the country.

The method of producing and treating this "Rayon" is as follows: I either take the staple fibers of "Rayon", that is, the relatively short pieces which may be had by chopping "Rayon" threads, or I employ the "Rayon" waste or, if desired, a mixture both of the waste and staple fibers may be used. This raw stock is then placed in a standard raw stock dyeing machine or large vat, which has previously been filled with water, and the water having been heated to 110° F. which is usually accomplished by letting steam into the vat.

These dyeing machines or vats are generally of a vacuum principle, so that there will be an agitation within the vat, caused by the pulsation or movement of the water in the vat rather than a mechanical agitation, as if a mechanical agitator were used it would be apt to become clogged with the raw material that is to be treated.

After the vat has been filled with water and heated substantially to 110° F. I then add a mixture of olive oil and palm oil, either in liquid or granulated soap form, in the ratio of two pounds of the olive oil and palm oil for each one hundred pounds of fiber added. The proportion of olive and palm oil may be substantially fifty per cent of each, or I have found at times that it may be desirable to change this proportion to substantially seventy-five per cent of one and substantially twenty-five per cent of the other.

The machine, with these added oils, is permitted to run for about ten minutes, so as to completely distribute the oils throughout the bath.

The machine is then opened and the fibers placed therein, the temperature being then raised to approximately 130° F. After the machine is closed, steam or heat is applied to the macine and the temperature is raised to substantially 130° F. At this time, also, to each one hundred pounds of fiber, I add two pounds of common salt or Glauber's salt and the mass is agitated in the machine for substantially twenty minutes. After these twenty minutes, the steam or heat is cut off and the mass allowed to be agitated ten minutes more in the machine.

The fiber is then removed and without rinsing passed mechanically or manually to a "squeeze roll extractor", and it is to be here carefully noted that the rolls are to be spaced some little distance from each other, so as not to press out the oils that have been thoroughly mixed with the "Rayon" mass, but to simply press the mass into a compact sheet form. This is for the purpose of setting the little twists and kinks in the fibers.

After this, the mass is mechanically conveyed to a fluffing or opening device, wherein the fibers are fluffed and opened and then the mass is subjected to a standard form of raw stock drier, where the same is subjected to a heat treatment and drying for approximately thirty minutes

and at a temperature of 180° F. Here, it is also necessary that the fibers now in fluffed form be not baked, which might again drive out all the oils, but the mass is simply dried.

The material is now a fluffy mass with the individual fibers thoroughly shrunk and kinked and similar to raw wool or cotton in appearance. It is also free from objectionable odors and rancidity and does not have the usual thin, wiry feeling of the ordinary staple fiber or "Rayon" waste, is silk-like in appearance, and does not agitate the skin.

As before mentioned, the fiber will take the twist faster than wool or cotton, and is strong, elastic and can be run at a high rate of speed and is ready for use on the ordinary mechanical equipment used with either wool, cotton, worsted or silk systems.

The fiber made into yarn for fabrics has the appearance of wool and also the advantages mentioned over wool.

Finally, it will be seen that it can be produced much cheaper than the ordinary "Rayon" thread, as short staples may be utilized and mixed with "Rayon" waste, or simply "Rayon" waste may be utilized.

Having thus described the improved synthetic fibers and method of making the same, what I claim as new and desire to secure by Letters Patent is:—

1. The method of treating viscose "Rayon" staple fibers which consists in placing the mass of staple fibers in a vat containing water in which there is placed substantially two pounds of olive oil and palm oil to every one hundred pounds of the fibers, the bath also containing substantially two pounds of salt, heating the bath to substantially 130°, and agitating the mass for approximately twenty minutes, subjecting the mass to a squeeze roll to set the kinks and to squeeze the mass into a mat-like form, subjecting the mat to a fluffing machine, and then subjecting the mass to a drier the temperature of which is substantially 180°.

2. The method of treating short fibers of "Rayon", which consists in placing in a vat water containing two pounds of olive oil and palm oil and two pounds of salt to every one hundred pounds of fiber to be treated, heating the bath for about ten minutes to 110° and agitating the bath for ten minutes, then raising the bath to substantially 130° and placing the mass within the bath and agitating it for substantially twenty minutes, cutting off the heat and allowing the mass to be agitated for approximately ten minutes more, subjecting the mass to rolls for setting the fibers but not squeezing the oils therefrom, subjecting the mat to a fluffing machine, and then subjecting the fluffed mass to a drier for ten minutes whose temperature does not exceed 180°.

GUSTAV JEAN NORD.