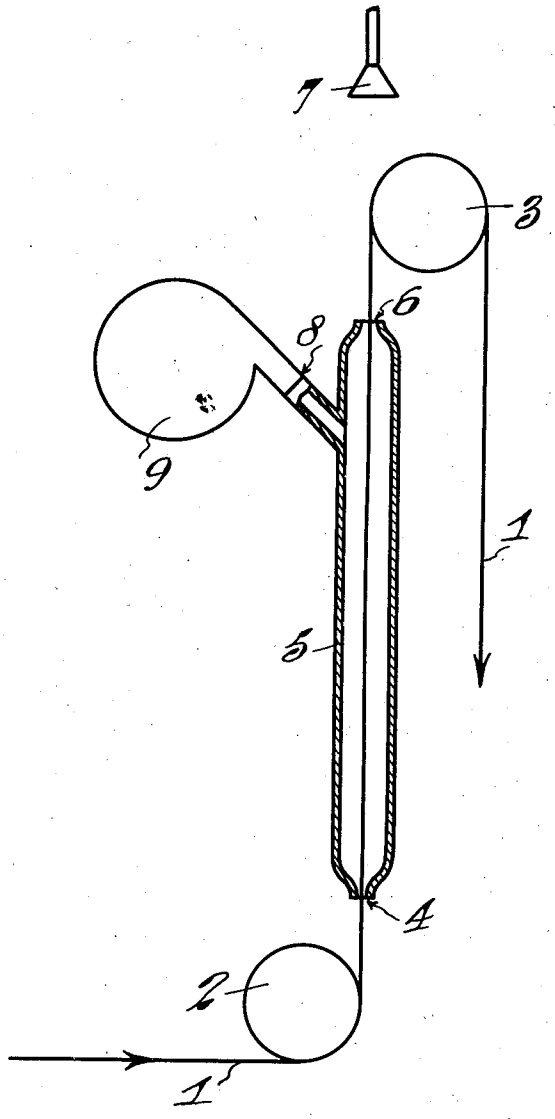
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METHOD AND APPARATUS FOR MANUFACTURE OF STAPLE FIBER

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METHOD AND APPARATUS FOR MANUFACTURE OF STAPLE FIBER

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8 Claims. (Cl. 18—8)

The present invention relates to the manufacture of artificial silk filaments from cellulosic spinning solutions, but primarily has for its object the production of staple fiber in a continuous operation.

It has heretofore been the practice in the art to produce staple fiber from artificial silk by first twisting a large number of freshly spun threads into a rope-like hank and then winding it upon reels in order to be subjected to the usual after-treatment. Since these rope-like hanks possess a tensile strength of 10,000 denier or more, it is obvious that the hanks require strong and costly machinery.

Another well known method of producing artificial fiber comprises cutting the single threads immediately upon the spinning thereof, and then subjecting them to the usual after-treatment. It has also been proposed to stop intermittently the extrusion of the threads through the spinnerettes in order to produce short pieces of thread. The after-treatment of these short pieces of thread, however, require many manipulations which increase the cost of production.

Still another method of producing staple fiber which has been proposed is the spinning of threads into spinning pots. The latter are rotated at high speed, whereby the moisture is extruded from the yarn. This process has also proved very costly due to the amount of labor required to obtain the finished product.

In a copending application, Serial Number 28,679, to Erhard Witte, filed June 27, 1935, a process is disclosed for simplifying and improving the manufacture of staple fiber from filaments of cellulosic origin in continuous operation thus overcoming the disadvantages of the methods heretofore used and outlined above. This process comprises the steps of collecting the threads from a large number of spinning places into one large bundle of threads and leading the said bundle up and down a plurality of times over a series of guiding devices, whereby, during the upward passage thereof and when no tension is imparted thereto, the bundle of threads is washed and after-treated in counter-current stream of treating solution.

It is a purpose of the present invention to improve the washing of the thread bundle in the process of the above mentioned application.

In the further development of this process it was found possible to improve the washing of the thread bundle while moving upwardly, if water of at least 46° C. was used. This temperature was particularly suitable because it coincided with the boiling point temperature of carbon bisulphide, so that the carbon bisulphide remaining in the freshly spun thread was easily removed therefrom. Simultaneously with the removal of the carbon bisulphide other gases contained therein were released and thus removed from the thread bundle.

The waste gases arising therefrom in large quantities, which gases have always proved greatly detrimental to the quality of artificial yarn, are removed from the thread bundle at a place where they may most easily be carried off and disposed of.

The present invention provides a tube or incasement for surrounding the thread bundle and which is connected to a suction device. The device is so constructed that the thread bundle can freely enter and leave through top and bottom openings. It is advisable to construct the tube in such a manner that it may be opened longitudinally in order to reach the thread bundle if necessary. The tube is preferably provided with inspection openings or the entire device may be made from glass in order to enable the operator to watch the washing process. An exhauster or some similar device is positioned at the upper end of the tube for carrying off the deleterious gases which are present in a rather concentrated form. Due to the degree of concentration they may be easily condensed or otherwise rendered harmless by any well known manner.

The present application therefore relates to the manufacture of staple fiber from filaments of cellulosic origin in a continuous operation, but primarily has for its object an improvement in the after-treatment thereof. This and other objects will in part become obvious and will in part be pointed out in the specification and appended claims when taken in conjunction with the attached drawing in which is shown a schematical view of a form of the device for carrying out the invention.

In the drawing in which like numerals of reference indicate like parts, 1 indicates the thread bundle which is led around a guide roller 2 rotating at a higher circumferential speed than the guiding device 3. The thread bundle 1 enters the tube-like jacket through the lower opening 4 and after passage through the said tube 5 passes out of the opening 6 to the guide roller 3. A nozzle 7 is placed above the thread 1 and directs a washing spray thereon. The treating solution used preferably has a tempera-

ture of 46° C. and washes the thread by passing counter-currently thereto.

A suction or exauster device 9 is connected at 8 to the jacket 5 for the purpose of carrying off the waste gases therefrom.

It is, of course, understood that the temperature of the washing solution may be of a higher temperature than 46° C. in order to speed up the removal of the carbon bisulphide and the other gases contained in the thread.

From the foregoing specification, taken in connection with the accompanying drawing, it is thought that complete operation, construction and the advantages of the novel process and apparatus will be clear to those skilled in the art to which it relates.

What is claimed is:

1. In a method of treating freshly spun viscose yarn, the step of passing said yarn in an untensioned strand formation upwardly through a treatment zone, washing said strand in the zone with a counter-current water bath, and at the same time with the washing exposing said strand to suction to draw off gases released from said strand.

2. A continuous method of treating freshly spun viscose filaments, which includes washing an untensioned moving thread bundle of said filaments by passing said bundle through a counter-current water bath maintained at at least 46° C., and simultaneously drawing off deleterious gases therefrom.

3. A device for use in the continuous wet-treatment of filaments of artificial origin comprising, an upper and a lower rotatable thread guiding means, a tube disposed between said thread guiding means and positioned to surround thread passing between said guiding means, a suction device attached to said tube in close proximity to its upper end, and spraying means positioned above said upper thread guiding means.

4. A device of the type set forth comprising, a vertically disposed tubular chamber, rotatable means positioned to pass thread vertically through said chamber, a suction device attached to the upper portion of the chamber, and a spraying means positioned above the upper end of said chamber.

5. A device for use in the continuous wet-treatment of filaments of artificial origin comprising, a vertically disposed tube having a bottom and a top opening of reduced diameter, a duct in said tube in close proximity to the top opening, a suction device attached to said duct, rotatable thread guiding means positioned to pass thread vertically and upwardly through said tube, and spraying means above said top opening adapted to spray the thread counter-currently to its direction of travel.

6. In a method of wet-treating strands of freshly spun viscose filaments, the step of simultaneously drawing off gases released from said strands while they are being washed by a counter-current bath during their travel vertically upward in an untensioned condition.

7. In the manufacture of artificial yarn by the viscose process, the step which includes passing the yarn without subjecting it to tension through a tubular chamber, washing the yarn in said chamber with a counter-current bath, and simultaneously subjecting the yarn to suction to remove deleterious gases therefrom.

8. In a method of wet-treating strands of freshly spun filaments of artificial origin, the step of washing the filaments while in an untensioned condition in a counter-current flow of liquid and at the same time acting upon the filaments with suction so as to remove gases released during such liquid treatment.

ERHARD WITTE.