

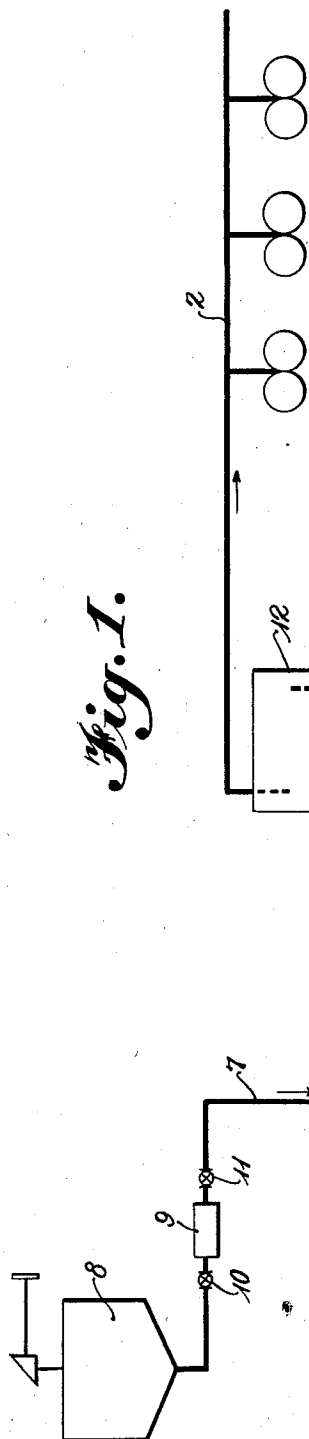
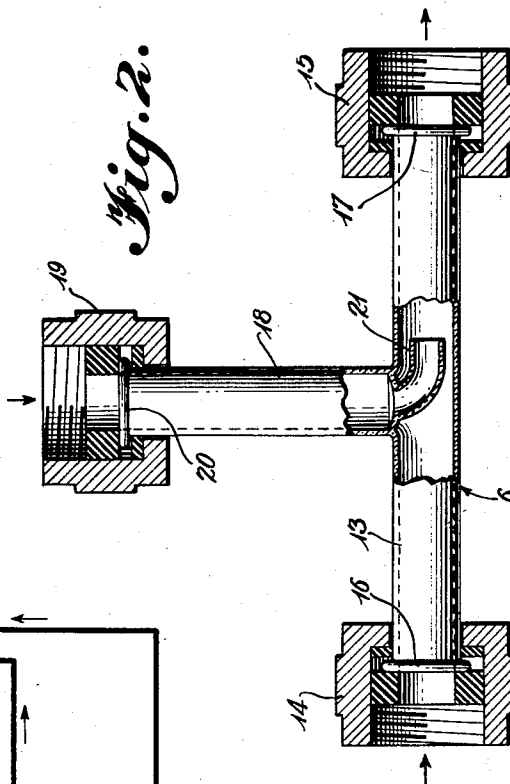
April 26, 1960

T. E. PATTON

2,934,448

SPUN DYED YARN

Filed May 19, 1954



INVENTOR

Theodore E. Patton

BY

Met R. Poston

ATTORNEY

1

2,934,448

SPUN DYED YARN

Theodore E. Patton, Enka, N.C., assignor to American Enka Corporation, Enka, N.C., a corporation of Delaware

Application May 19, 1954, Serial No. 430,813

2 Claims. (Cl. 106—165)

This invention relates to a method for adding an adjustable amount of a liquid to a viscous spinning solution and is an improvement in the invention described in Serial Number 417,196, filed March 18, 1954, now abandoned in favor of continuation application Serial No. 655,004, filed August 25, 1957.

In said application Serial No. 655,004 there is described a system for adding materials such as dyestuff to a spinning solution. According to that application, the spinning solution being delivered to the spinnerets is divided into two streams and, in one of the streams, a suction zone is created by arranging two pumps in tandem, the second drawing more than the first delivers. The desired additive is introduced into this suction zone through an ordinary T-connection.

While the above arrangement is entirely satisfactory for some additives and for some spinning solutions, it has been found that the homogeneity of dye distribution in viscose is not reliably maintained.

It is therefore an object of the present invention to overcome this difficulty and to provide for an improved admixture of an additive with a spinning solution.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description of a preferred embodiment thereof in conjunction with the annexed drawings, wherein:

Figure 1 is a schematic layout of an additive supply system in which the present invention is incorporated; and

Figure 2 is a side view to an enlarged scale partly in section showing an additive introduction arrangement according to the present invention.

In accordance with the present invention, the above-identified system of providing a shunt stream of viscose and introducing a predetermined quantity of additive thereto prior to combining with a main stream is improved upon by installing at the point of additive introduction a special T-connection having a nozzle which insures that all of said dispersion is introduced coaxially or centrally of the shunt stream in a direction toward the high capacity pump. This improved system has been found to result in much more homogeneous mixing without the necessity of additional elaborate equipment.

Referring to the drawing in greater detail, a viscous spinning solution is supplied through a pipeline 1 to a spinning machine 2 through a mixer 12. The pipe 1 has a shunt or by-pass 3 through which part of the spinning solution flows. In this shunt there are located two gear pumps 4 and 5 which are interconnected in series by a tube including the cross conduit of a T-connection 6. A supply pipe 7, serving to supply a dyestuff solution or a pigment suspension from a reservoir 8, discharges into the intersecting conduit of the T-connection 6. A filter 9 is located in the pipe 7 and, associated with the filter, are valves 10 and 11.

During use the pipe 7 is in open connection with the reservoir 8 for the low viscosity additive. The shunt or by-pass pipe 3 and the main viscose pipeline 1 discharge

2

into the mixer 12, and, from the mixer 12, the mixture goes to the spinning machine 2. The particular mixer used at 12 forms no part of the present invention and any suitable mixer may be used. Pump 4 is operated to deliver less than pump 5; therefore dyestuff solution or pigment suspension flows from pipe 7 through the connection 6 into the spinning solution, the total of the two solutions meeting the pumping demand of pump 5.

In Figure 2, the T-connection 6, with both cross and intersecting conduits, is shown to an enlarged scale. The cross conduit which connects it to pumps 4 and 5 is designated by reference numeral 13. This conduit is held in position by threaded collars 14 and 15 provided with suitable sealing gaskets operating around flanges 16 and 17 at the end of tube 13. The intersecting portion of the T-connection 6 which connects to the conduit 7 is designated by numeral 18 and it is provided with a collar 19 and sealing gaskets working with an end flange 20.

At the point where the conduit 18 discharges into the conduit 13 a nozzle is formed which carries the dyestuff into the center of the stream in conduit 13. This nozzle bears reference numeral 21. The nozzle is of substantially uniform cross-section throughout its length but the conduit area within the nozzle 21 is less than the conduit area within the tube 1. Nozzle 21 is curved so that its mouth faces pump 5.

As shown in Figure 2, the entire T-connection, except for the collars 14, 15 and 19, is made of glass. Glass is a suitable material because it is resistant to the chemicals used, and it is also possible to form a fairly complex structure such as is shown in Figure 2 without excessive machining. Also, the merging of the two solutions may be observed.

From the foregoing description, it will be appreciated that the present invention involves dividing the flow of spinning solution into two paths and then introducing the additive into the center of the stream in one of those paths prior to introduction into a mixer whereby a homogeneous distribution of the additive in the entire spinning solution is brought about. In the case of adding a dye dispersion to viscose solution the improved results obtained with the present invention are believed to be due to the fact that under the conditions of viscous flow existing in the pipe 3 the dye dispersion does not intimately mix with the viscose solution until introduced into mixer 12. This arrangement prevents stratification of the dye dispersion in pipe 3 and also facilitates the pumping of the mixture through pump 5. While in the illustrated embodiment the pumps 4 and 5 in the additive line are applied to a by-pass in the main system, the actual proportioning of flow between the lines 1 and 3 may vary considerably even to the point where the line 3 carries more than half of the total spinning solution.

Inasmuch as other alternatives and modifications will become apparent to those skilled in this art, it is intended that the present invention be limited only to the extent set forth in the following claims.

What is claimed is:

1. In an apparatus for blending a dye dispersion with a viscose spinning solution having higher viscosity than said dispersion including a supply conduit for supplying viscose spinning solution to said blending apparatus, a delivery conduit for delivering said viscose spinning solution to a spinning machine, a pair of connecting conduits extending from said supply conduit to said delivery conduit, one of said connecting conduits supplying viscose spinning solution from said supply conduit directly to said delivery conduit, a gear pump of low capacity and a gear pump of high capacity in the other of said connecting conduits, the gear pump of high capacity being nearer said delivery conduit, and means providing a supply

3

of dye dispersion, the improvement comprising a T-connection having a cross conduit connecting said pumps in series within said other connecting conduit and an intersecting conduit, said intersecting conduit terminating in a nozzle disposed centrally and coaxially of the cross conduit, and means connecting said intersecting conduit to said supply of dye dispersion.

2. In a method for blending a dye dispersion with a viscose spinning solution having higher viscosity than said dispersion including the steps of maintaining a supply of viscose spinning solution, dividing said supply into first and second streams, directing viscose spinning solution from said first stream toward a spinning machine, feeding viscose spinning solution into said second stream at a first rate and withdrawing said solution from this stream at a second, higher, rate, supplying a dye dispersion to said second stream at a point prior to withdrawal of said second stream at said higher rate, and combining said first and second streams before introduction to said

4

spinning machine, the improvement comprising introducing all of said dye dispersion from the supply therefor coaxially into the center of said second stream, whereby homogeneous blending of the dye within the viscose solution will occur.

References Cited in the file of this patent

UNITED STATES PATENTS

1,007,788	Mills	Nov. 7, 1911
1,907,486	Boileau	May 9, 1933
2,541,799	White	Feb. 13, 1951
2,565,374	Kitchel	Aug. 21, 1951
2,650,168	Dijk	Aug. 25, 1953
2,656,648	Friedman	Oct. 27, 1953
2,768,135	Adelson	Oct. 23, 1956

FOREIGN PATENTS

2,741	Great Britain	Feb. 22, 1887
-------	---------------	---------------