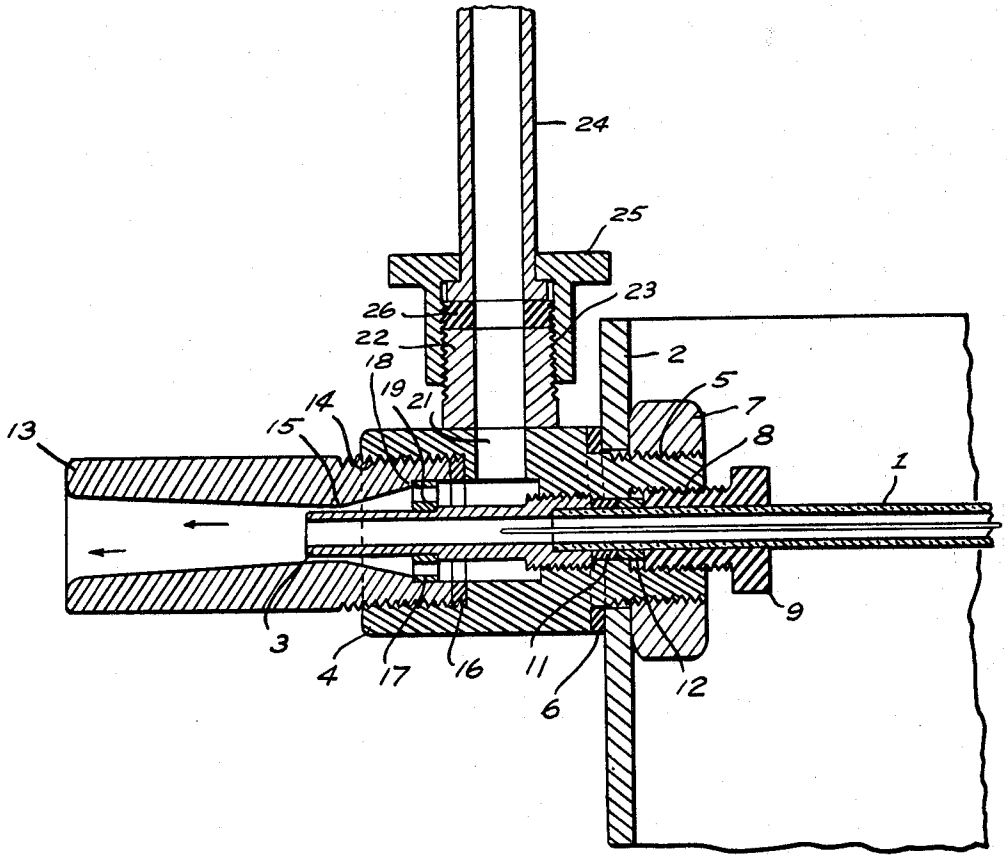
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PROCESS AND APPARATUS FOR THE PRODUCTION OF NOVELTY YARNS

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INVENTOR.

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PROCESS AND APPARATUS FOR THE PRODUCTION OF NOVELTY YARNS

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3 Claims. (Cl. 18—8)

This application is a division of application 280,838 filed May 16, 1963.

This invention relates to an apparatus for producing novelty yarns and more particularly to the production of synthetic yarns wherein the material is formed into spaced knops or knots.

An object is to provide a new and improved apparatus for the above purpose.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

The apparatus according to the present invention spins a coagulatable solution by means of a tube centered on the spinneret and in which the tube opens into an ejector, the outlet nozzle of which forms a Venturi tube, the yarn being drawn axially at a reduced rate at the outlet of the nozzle.

The spinning tube or the element which forms the prolongation thereof extends beyond the constriction of the Venturi tube.

This process and the said arrangement makes it possible to obtain a knop yarn of good quality at high speeds, for example in the viscose process. The knop yarn which is obtained is adapted for numerous uses, for example in the manufacture of fabrics known as "Doupion," intended for example for fashion wear or for decorative purposes.

The invention will be better understood by reference to the accompanying drawing, which shows diagrammatically an apparatus embodying the present invention.

The drawing shows the downstream end of a spinning tube 1, the upstream portion thereof not being illustrated. Such a tube is centered in well known manner opposite the face of a spinneret. This tube 1 extends through a hole in the wall 2 of the bath tank, into which extends the spinneret (not shown) as well as the tube 1. The latter is extended by the axial tube 3 of the ejector. The axial tube 3 is centered in the body 4 of the ejector which is reduced at the upstream or inlet end and is provided with a screwthread 5 on this reduced portion. This portion is fitted into the hole of the wall 2 of the bath tank. The bearing is produced by a joint 6 and a nut 7 permits the seating thereof. Furthermore, the body 4 of the ejector is also tapped at 8 for a threaded fixing plug 9 fitting on the spinning tube 1. A flexible joint 11 and a washer 12 permit the locking action between the axial tube 3 of the ejector and the threaded plug 9. The body 4 of the ejector thus ensures the rigid mounting of the spinning tube 1.

An outlet nozzle 13 is screwed into the internal thread of the mouth 14 of the body 4 of the ejector. The interior of the nozzle has the contour of a Venturi tube and comprises a constriction 15. The internal nozzle 3 of the ejector projects beyond the constriction 15. A flexible washer 16 provides a tight coupling between the outlet nozzle 13 and a shoulder at the end of the internally threaded portion 14 of the body 4. A perforated disc 17 centers the tube 3 inside the outlet nozzle 13 by bearing against two small shoulders 18 and 19.

The body 4 of the ejector includes an opening 21 into which opens a lateral nozzle 22 with a screwthread 23. This nozzle 22 is connected to a bath supply tube 24 complementary to the ejector. The two elements 22 and 24 are held together by a nut 25 with an intermediate flexible joint 26.

The operation is as follows: A strong stream of spinning bath is injected through the tube 24 and this bath flows through the nozzle 22 and the opening 21, then through the perforations of the disc 19, and primes the ejector, thereby drawing the bath from the tank through the tube 1 together with the yarn supplied by the spinneret.

The yarn is ejected at high velocity into the outlet nozzle 13 and is withdrawn therefrom at reduced speed axially by appropriate discharge elements (not shown). The contour of the Venturi tube causes a slowing down of the bath flow and an accumulation of yarn, which is produced in the nozzle 13 and at the outlet end thereof. The discharge elements, pulling the yarn at reduced speed, strip the yarn in bunches from the mass and these bunches form the knops. The knop yarn thus produced is collected for example in pot form, the cakes which are formed undergoing the usual finishing treatments.

By modifying the delivery of the complementary bath and/or the contour of the nozzle 13 and/or the drafting speed by the delivery members, it is possible to obtain variations in the frequency and the size of the knops. It is obvious that other modifications can be imposed by varying the rate of delivery of the spun solution, the number of strands, the activity of the bath, etc. Furthermore, the complementary bath does not have to be identical with the spinning bath and it may also be at a different temperature.

The novelty yarns obtained under these conditions have a lower tenacity than the normal yarns. They can be assembled with normal yarns of the same nature or of different nature.

It is thus possible to add a normal viscose rayon yarn produced by a conventional arrangement to the knop yarn before the finishing and to introduce the two plies together into a hydroextractor with a winding twist.

For example, there may be used a viscose containing 9.05% of cellulose and 6.20% of caustic soda, prepared by using 30.8% of carbon disulphide calculated on dry cellulose. This viscose is spun at the index 6.50 with a spinning viscosity of 95 poises.

Spinning takes place at 52° C. in a bath containing 130 g./l. of sulphuric acid, 240 g./l. of sodium sulphate and 15 g./l. of zinc sulphate.

A yarn with a mean count of 150 denier is produced.

Three practical embodiments will be apparent from the following table:

	Example 1	Example 2	Example 3
Count, denier:			
Total	150	150	150
Support yarn	100	75	100
Knop yarn [1]	50	75	50
Spinning speed,[2] meters/min	75	70	110
Delivery of injection bath, liters/min	5.5	6	8

[1] The count of the knop yarn is the mean count.
[2] The spinning speeds correspond to the winding speed in the hydroextractor.

What is claimed is:

1. Apparatus for producing a novelty yarn comprising a spinning bath, a spinning tube immersed in said bath and adapted to receive the spinning bath and coagulated filaments from a spinneret, said spinning tube terminating in an ejection zone, a Venturi tube immersed in said bath and disposed in registration with said tube in said

ejection zone and adapted to receive the spinning bath together with the coagulated filaments, said Venturi tube having an expanding opening adapted to reduce the rate of flow of said bath and to thereby form a mass of tangled filaments having knops spaced along the length thereof.

2. Apparatus as set forth in claim 1 wherein said spinning tube extends into the expanding opening of said Venturi tube.

3. Apparatus according to claim 1 having means introducing additional spinning bath around said spinning tube and into said Venturi tube for thereby introducing a flow of spinning bath through said spinning tube.

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WILLIAM J. STEPHENSON, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,295,162 January 3, 1967

Georges Forceville

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the heading to the printed specification, after line 10, insert -- Claims priority, application France, May 16, 196 897,723 --.

Signed and sealed this 7th day of November 1967.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents