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DEVICE FOR STRETCH SPINNING
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Devices for spinning artificial silk according to the cuprammonium stretch-spinning process with employment of flowing precipitating liquor in which an insertion of smooth conical shape, through which the filament bundle issuing from the nozzle is led, is disposed within a jacket, are well known. The precipitating liquor enters the circular space formed by the two vessels, and moves upwards in this space, until appearing over the edge of the insertion, it flows through the inner space of the same together with the filament bundle, drawing the latter out at the same time, and finally leaves the vessel.

It has now been found that the filament produced with the above described apparatus frequently shows a varying texture which makes itself detrimentally apparent when working up to textiles by the fact that the products exhibit undesirable irregularities. Exhaustive researches on such spinning devices have shown that periodical variations in concentration appear particularly in the lower part of the insertion; they are apparent in the form of cloud-like turbidities. The filament bundle consequently traverses layers of the precipitating bath which differ sharply in copper and ammonia concentration, as a result of which a non-uniform precipitation is effected, and the filament shows non-uniformity of texture in its progress.

The present invention consists of a device which avoids these disadvantages. A conical insertion arranged within a jacket possesses apertures which place the interior of the insertion into open communication with the interior of the jacket. These apertures always enable enriched quantities of copper or ammonia to diffuse from the interior of the insertion into the space of the jacket, so that large variations in concentration are practically avoided or at least are very considerably diminished. The apertures are arranged in parallel series in such a manner that those of one series are staggered with respect to those of another series.

Insertions for spinning vessels consisting of a spiral which narrows off towards its lower end, the convolutions of the said spiral mutually overlapping, are known. These devices are used in spinning apparatus with non-flowing precipitating liquor, in which this liquid therefore merely moves owing to the withdrawal of the thread and is renewed.

In this process the spiral shaped insertion has the advantage that the small thread suction is quite sufficient to produce partial flow from the surrounding jacket into the interior of the insertion at all places of the latter, so permitting the filament always to come into contact with fresh precipitating liquor during the whole of its progress.

In the stretch-spinning process with flowing precipitating liquor, in which the filament is conveyed forward and stretched by the suction of the liquid, spiral shaped insertions show no advantages, for sufficient renewal of the precipitating liquor may be effected most simply in this process by suitable regulation of the flow. In this process, however, the overlapping of the spiral convolutions of the insertion show considerable disadvantages, for at these places, under the influence of the streaming precipitating liquor, violent eddies are set up owing to the sudden transition, which are injurious to the texture of the filament.

The disadvantages which may appear, for example, owing to excessive enriching of the precipitating liquor in copper and ammonia, are to be removed, as we have recognized, not alone by the production of partial streams with fresh precipitating liquor, but also by the medium of diffusion, which is perfectly harmless to the formation of the filament and which occurs at the apertures of the spinning nozzle which is smooth throughout its length.

In the accompanying drawing the device according to our invention is shown schematically in one constructional form, by way of example. A funnel-shaped insertion 2 is situated concentrically within a cylindrical vessel 4. The middle portion of the member 2, situated in the cylindrical vessel, is provided with apertures 3. These apertures are arranged in six series of four holes each, the apertures of individual series being staggered with respect to one another. The precipitating liquor enters the outer circular space from below through the supply pipe 4; it rises in the said space until it flows over the edge of the funnel-shaped insertion and moves downwards together with the filament bundles. The precipitation of the filaments occurs during this motion, and sharp variations in concentration in the form of cloudy turbidities are not to be seen, or scarcely to be seen.

What we claim is:

1. A stretch-spinning device comprising a vessel, a conical shaped insertion extending through the bottom of said vessel and tightly fitted in said bottom, the part of the insertion projecting into the interior of the vessel being provided with a plurality of openings in the side walls of the insert, said openings being spaced with respect...
to the length of the insertion and said vessel being provided with an inlet positioned below said openings.

2. Apparatus for spinning artificial filaments by the stretch-spinning process, comprising a vessel, a spinning nozzle near the top of the vessel, a member below the nozzle having a funnel-shaped portion within the vessel, apertures being formed in said funnel-shaped portion and spaced lengthwise thereof, and a portion extending through the bottom of the vessel and tightly fitted therein, the outlet end of said latter portion having an opening of restricted area with respect to the cross-sectional area at the lower end of the funnel-shaped portion, and means to admit precipitating liquid to the vessel adjacent the bottom thereof, the construction and arrangement of said member being such that precipitating liquid diffuses through said apertures from within the funnel-shaped member directly into the vessel.

3. A stretch-spinning device comprising a vessel, and an insert including a funnel-shaped portion within the vessel and a portion extending through the bottom thereof, the funnel-shaped portion of the insert being provided with apertures in its side walls, said apertures being arranged in a plurality of rows spaced lengthwise of the insert, and said vessel being provided with an inlet for precipitating liquid below said apertures.

4. The combination as claimed in claim 3 wherein the apertures are staggered.

5. An apparatus for spinning artificial filaments comprising a spinning nozzle, a casing, an insert in said casing adapted to receive the filaments extruded from said nozzle and positioned in contact with the wall of the casing so as to prevent passage of precipitating liquid therebetween, said insert having a plurality of perforations spaced longitudinally thereof and arranged to leave a space at the bottom of the insert free from perforations, and means for supplying liquid to said casing at a point below the perforations.

6. A device as defined in claim 5 in which the upper portion of the insert is free from perforations and is closely spaced with relation to the rim of the spinning nozzle.

7. A device as defined in claim 5 in which the insert extends through the casing and is provided with a constricted outlet.

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