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CONTINUOUS TREATMENT OF INDIVIDUAL STRETCHABLE THREADS FOR EXAMPLE ARTIFICIAL SILK THREADS

Filed Dec. 22, 1954

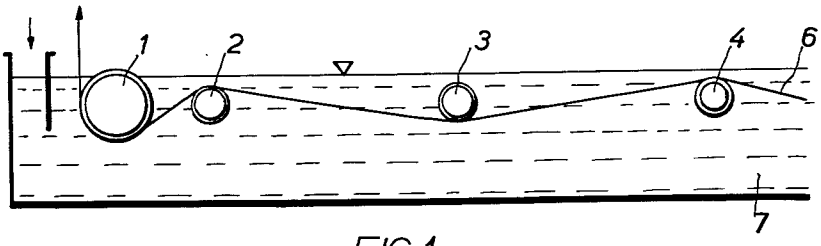


FIG. 1

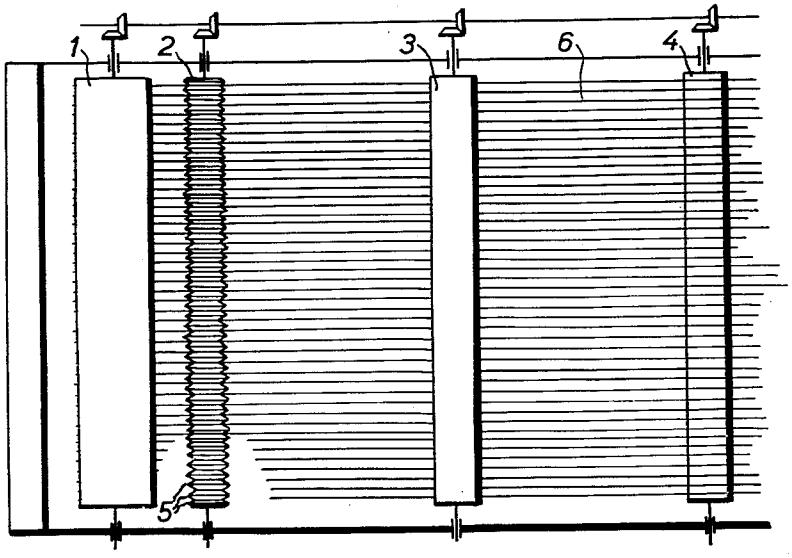


FIG. 2

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CONTINUOUS TREATMENT OF INDIVIDUAL STRETCHABLE THREADS, FOR EXAMPLE ARTIFICIAL SILK THREADS

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1 Claim. (Cl. 8—151.2)

The invention relates to the continuous treatment of individual threads which are adapted to stretch, for example artificial silk threads, travelling closely adjacent one another in liquid baths which are provided with driven rollers for advancing a group of threads passing alternately over and under the rollers; the rollers are preferably arranged horizontally below the level of the liquid in the bath and spaced from one another.

Great difficulties are experienced with apparatus of this type. In particular, it is necessary, in order to avoid over-elongation of the threads, to keep the tension of the threads as small as possible, and this involves practically equal peripheral speeds of all the rollers; however, it is also a requirement that the tension of the individual threads be increased in order to prevent the threads running together and possibly uniting, with consequent breakages of the threads. It is very difficult, and in certain circumstances impossible, to find a satisfactory limit when handling sensitive material with a large reserve of elongation.

In accordance with the present invention, these difficulties can be overcome by rotating the final roller at a higher peripheral speed than the other rollers, and by rotating the penultimate roller, which is advantageously arranged at a small distance from the final roller, at a lower peripheral speed than the other rollers. The penultimate roller can have depressions arranged on its surface transversely of its longitudinal axis.

Due to the fact that the peripheral speed of the final roller is higher, and the peripheral speed of the penultimate is lower, than the peripheral speeds of the preceding rollers in the bath, the tension necessary with threads having large elongation reserves is reached without any fear of the threads runing together or being over-elongated. The more slowly rotating penultimate roller produces the elongation reserve in the travelling thread material and the greater peripheral speed of the final roller with respect to the preceding rollers in the bath, all of which rollers revolve at the same speed, causes a gradual increase in the tension of the thread within the entire system, so that a more accurate guiding of the individual threads with respect to one another is obtained than has been possible hitherto. As a result, the individual threads are substantially prevented from running together and sticking to one another and a substantial increase in the withdrawal of the travelling threads

is possible. The impressions in the surface of the penultimate roller retain any impurities and cause any transverse flows of the bath to be deflected in the direction of the path of the threads.

One embodiment of the invention is shown diagrammatically in the accompanying drawing in which:

FIGURE 1 is a sectional view and

FIGURE 2 is a plan view.

As shown in the drawings a tank **10** containing a liquid bath **7** employed for the continuous treatment of a group of threads **6** has a number of driven rollers **1**, **2**, **3** and **4** arranged horizontally within it beneath the level of the liquid (indicated at **9**), the liquid level within the container being regulated by an inlet weir **8**. The group of threads passes alternately above and below the rollers. The final roller **1**, and the penultimate roller **2** are rotated at peripheral speeds which are respectively higher and lower than the peripheral speeds of the preceding or entrance rollers of the system which rotate at practically the same peripheral speed as one another. The rollers are driven from the line shaft **13** through bevel gears indicated at **12**. The bevel gears are positioned for actuating the roller shafts indicated at **12**. The surface of the penultimate roller **2** is provided with depressions **5** arranged transversely of the axis of the roller.

We claim:

Method for the continuous treating and drawing of individual threads in a liquid bath which comprises passing a group of threads positioned closely adjacent to one another through the bath in alternating fashion above and below the individual rollers of a series of driven rollers arranged horizontally therein beneath the liquid level of said bath while maintaining the threads out of contact with one another, rotating the final roller in the series at a higher and the penultimate roller at a lower peripheral speed than that of the preceding rollers in the series said preceding rollers being rotated at substantially the same peripheral speeds whereby the threads leave the bath at a constant speed greater than the entering speed thereof to the bath and whereby due to the lower speed of rotation of the penultimate roller, the threads pass through said bath under slippage permissive conditions, the resultant passage of the threads through the bath being in relaxed condition, the tension on the threads being exerted thereon only by the final roller.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,026,167 March 20, 1962

Rudolf Hofmann et al.

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, between lines 9 and 10, insert -- Claims priority, application Germany Dec. 24, 1953 --; column 1, line 44, for "runing" read -- running --.

Signed and sealed this 3rd day of July 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents