

Nov. 29, 1927.

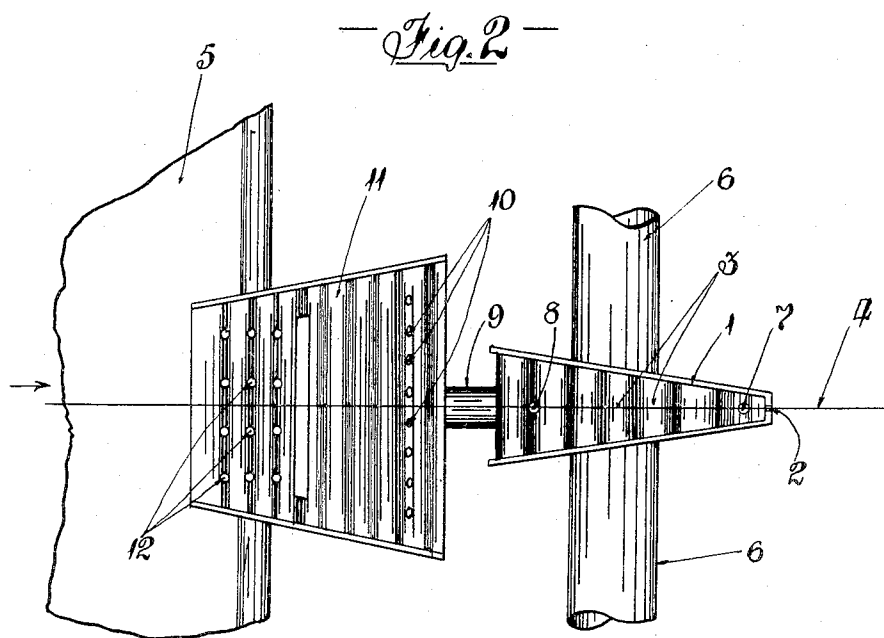
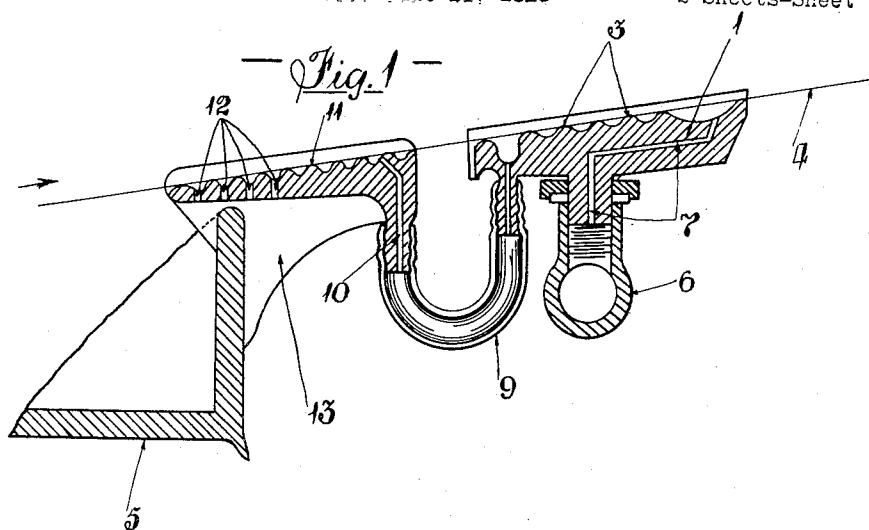
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F. W. SCHUBERT

MEANS FOR TREATING ARTIFICIAL SILK

Filed June 21, 1926

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

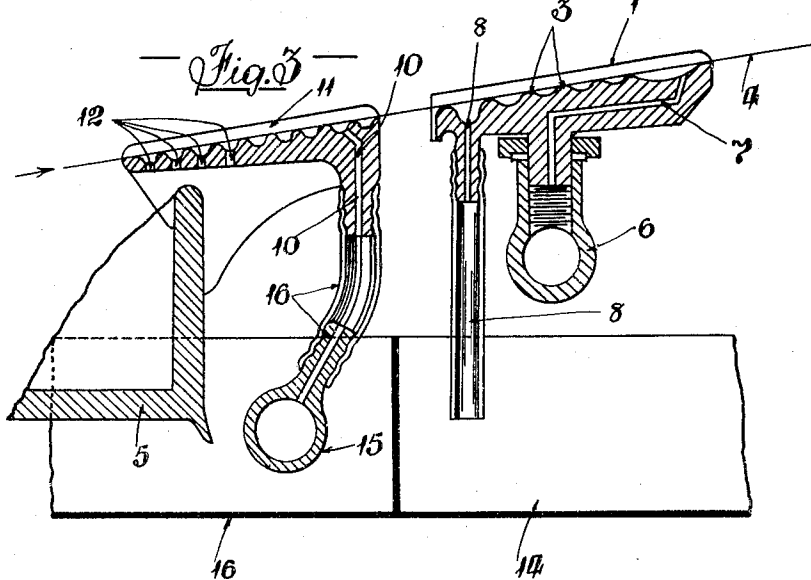
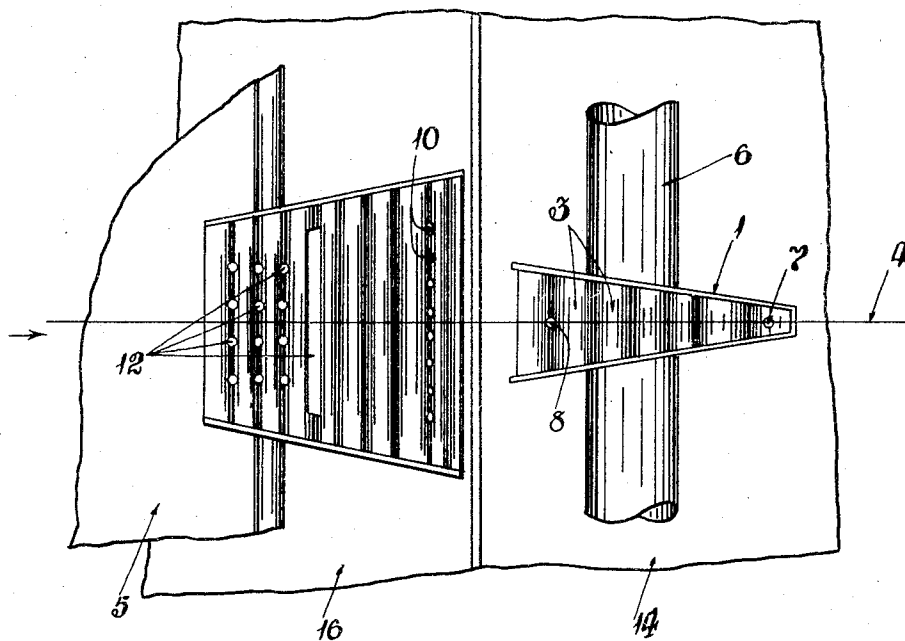


Fig. 4



Inventor
Friedrich W. Schubert
By Cushman, Bryant & Darby
Attys

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UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM SCHUBERT, OF APPERLEY BRIDGE, NEAR BRADFORD, ENGLAND, ASSIGNOR TO BRYSLKA, LIMITED, OF APPERLEY BRIDGE, NEAR BRADFORD, ENGLAND.

MEANS FOR TREATING ARTIFICIAL SILK.

Application filed June 21, 1926, Serial No. 117,536, and in Great Britain July 2, 1925.

This invention relates to the manufacture of artificial silk and more particularly to the spinning of filaments from thick liquids or solutions passed through a cylindrical spinning funnel or vessel depending into a bath and containing a liquid column of precipitating liquor, the chief object being to improve and simplify the machine or apparatus for effecting the stretch spinning of the filaments.

According to the invention, the filaments as they emerge from the spinning funnel or vessel are conducted through a combined guide and traversing device adapted to permit of the filaments or threads being treated with acid, water, or other treating liquor flowing in an opposite direction to the travel of the filaments or threads preparatory to winding.

In order that the invention may be clearly understood and readily carried into effect, the same will now be more fully described with reference to and by aid of the accompanying drawings; wherein:—

Figures 1 and 2 are respectively a sectional side elevation and plan of a combined guide and traversing device according to the invention and adapted for single washing.

Figures 3 and 4 are respectively a sectional side elevation and plan of the combined guide and traversing device as adapted for double washing.

Referring to the drawings, the combined guide and traversing device comprises a triangular shaped member 1, fitted or formed at its narrow end with a notch 2 or other appropriate thread guide and having its base or floor portion provided with transverse ridges or corrugations 3, over which the filament or thread 4 passes from the spinning vessel (not shown) and trough 5, to the winding on device or bobbin (not shown). The combined guide and traversing device 1, is mounted on a pipe or tube 6, through which water or other liquid for treating the filament or thread 4 may be supplied through an inlet opening 7, toward the front or narrow end of the member 1, so as to come into contact with the filament or thread 4, passing over the ridges or corrugations 3, towards the rear of the member 1. The washing liquid flows in the opposite direction to the movement of the filament or thread 4, thus bringing said thread 4 into repeated contact with clean liquor. The pipe or tube 6 is reciprocated

by any convenient means so as to impart to the devices or members 1, to and fro lateral motion in accordance with the winding of the filaments or threads 4.

In the example shown at Figures 1 and 2, the water or other liquid supplied to the member 1, is discharged therefrom by way of an outlet pipe 8, flexible pipe 9 and inlet 10, to a second corrugated member 11, over which the filament or thread 4 passes on its way to the member 1, thereby ensuring thorough washing of the filaments or threads 4. The member 11 is provided with drain apertures or holes 12 at its rear end, and is fitted to the front wall of the trough 5 by integral slotted side brackets 13.

In the example shown at Figures 3 and 4, acid is fed from the pipe 6 to the member 1, and after passing thereover, is drained off by way of the outlet pipe 8 into an acid drain trough 14, while water is fed by way of a pipe 15, branch pipe 16, and inlet 10, to the second corrugated member 11, and after passing thereover, is drained off by way of the holes 12 into a provided water drain trough 16.

In both of the forms it will be seen that the guide 1 which is reciprocated or constitutes a traversing member for properly delivering the thread or filament to a winding spool or bobbin is of such form that the liquid discharged thereon from the opening 7 will be spread into a thin film-like form as it flows over the ribbed surface.

This particular form of guide has been found to be of great practical importance as it permits of the free escape of ammonia gas and the action of the air on the thread passing over the guide is one which cannot be obtained when the guide is of relatively deep, narrow, channel-like form and through which a considerable volume of washing liquid flows.

The particular form of guide illustrated in the drawing and hereinbefore described, effects material reduction in the amount of wash liquor required and a higher state of concentration thereof than has been obtained by devices heretofore employed.

Further the shape of the guide avoids the bending of the thread at sharp angles as the guide is traversed to properly wind the thread upon the winding means.

By combining a guide of the character referred to with the guide member sup-

ported by the coagulating trough, as shown, an important advance has been made in the art of treating the filaments or threads drawn from said trough.

- 5 In practice the threads are drawn from the trough at a speed approximately thirty to sixty meters per minute, and when the guides between the trough and winding device are of the form of relatively deep and narrow channels where the thread is immersed in a relatively large volume of liquor, it is very difficult to free the threads or filaments from the chemical solutions with which they have been treated and which pass with the threads or filaments from the trough over the lower end of the guide.

To free the threads or filaments from a very considerable portion of the liquid drawn from the trough therewith, the guide 11 is provided as shown with a relatively large number of drain apertures adjacent the trough and further the supply of liquid thereto from the passage 10 moves as a relatively thin film permitting the free escape of ammonia and also allowing a partial oxidizing of the copper ammonia cellulose by the action of the air.

I claim:—

- 30 1. A combined guide and traversing device for use in the manufacture of artificial silk filaments or threads consisting of a body having an operative face which is gradually reduced in width and inclined upward toward its delivery end, and means for supplying a fluid to said operative surface so that it will form a film moving in a direction opposite to that in which the filaments or threads travel.

- 40 2. A combined guide and traversing device for use in the manufacture of artificial silk filaments or threads consisting of a body having an operative face which is gradually reduced in width and inclined upward toward its delivery end, said body having a fluid supply opening in its operative face near its delivery end, whereby fluid discharged from said opening will be spread over the operative face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel.

- 55 3. A combined guide and traversing device for use in the manufacture of artificial silk filaments or threads consisting of a body having an operative face which is gradually reduced in width and inclined upward toward its delivery end, said body having a fluid supply opening in its operative face near its delivery end, whereby fluid discharged from said opening will be spread over the operative face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel, and having a fluid escape opening near its lower, receiving, end.

4. A combined guide and traversing device for use in the manufacture of artificial silk filaments or threads consisting of a body having an operative face which is gradually reduced in width and inclined upward toward its delivery end, said body having a fluid opening in its operative face near its delivery end, whereby fluid discharged from said opening will be spread over the operative face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel, and said operative face being provided with a series of transversely extending ribs between its lower edge and the fluid supply opening.

5. A combined guide and traversing device for use in the manufacture of artificial silk filaments or threads consisting of a body having an operative face which is gradually reduced in width and inclined upward toward its delivery end, said body having a fluid supply opening in its operative face near its delivery end, whereby fluid discharged from said opening will be spread over the operative face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel, said operative face being provided with a series of transversely extending ribs between its lower edge and the fluid supply opening and a fluid escape opening being provided in a channel between two of said ribs adjacent the lower, receiving, end of the guide.

6. In a means for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are drawn from the trough, the upper face of said guide being provided with a series of transversely extending ribs that support the filaments or threads drawn thereover, liquid escape openings being provided in the bottoms of channels between the ribs on said guide adjacent the trough, a second guide supported beyond the delivery end of the first said guide and reciprocable in a direction transverse to the path of movement of the filaments or threads, said reciprocating guide having an operative face, over which filaments or threads move after leaving the first said guide, which is gradually reduced in width and inclined upward from its end adjacent the first said guide, and means for delivering liquid to the operative face of said second guide adjacent its upper delivery end so that it will spread over said face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel.

7. In a machine for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are

drawn from the trough, the operative face of said trough being inclined upward away from the trough, means for discharging liquid onto said operative face at a point adjacent its outer, upper, end, said face being provided with a series of transversely extending ribs that support the filaments or threads drawn from the trough thereover, a second guide supported beyond the delivery end of the first said guide and reciprocable in a direction transverse to the path of movement of the filaments or threads, said reciprocating guide having an operative face, over which filaments or threads move after leaving the first said guide, which is gradually reduced in width and inclined upward from its end adjacent the first said guide, and means for delivering liquid to the operative face of said second guide adjacent its upper delivery end so that it will spread over said face of the guide as a film moving in a direction opposite to that in which the filaments or threads travel.

8. In a means for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are drawn from the trough, the operative face of said guide being inclined upward away from the trough, a second guide positioned in alignment with and beyond the delivery end of the first said guide, the operative face of said second guide being gradually reduced in width and inclined upward toward its delivery end, means for supplying fluid to said operative face of the second guide adjacent its upper end, and means for delivering fluid onto the operative face of the first said guide adjacent the upper end thereof.

9. In a means for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are drawn from the trough, the operative face of said guide being inclined upward away from the trough, and having a fluid supply

opening formed therethrough near its delivery end, and a second guide positioned in alignment with and beyond the delivery end of the first said guide and adapted to be reciprocated in a direction transverse to the path of movement of threads or filaments over the guides, the operative face of said second guide being gradually reduced in width and inclined upward toward its delivery end, said second guide being provided with a fluid supply passage having a discharge opening adjacent the upper end of its operative face.

10. In a means for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are drawn from the trough, the operative face of said guide being inclined upward away from the trough, a second guide positioned in alignment with and beyond the delivery end of the first said guide, the operative face of said second guide being gradually reduced in width and inclined upward toward its delivery end, each of said guides being provided with a fluid supply opening in its operative face adjacent the upper end thereof, and means for supplying fluid to said openings of both guides.

11. In a means for treating artificial silk filaments or threads, the combination with a coagulating trough, of a guide overhanging the upper edge of a wall of said trough and over which the filaments or threads are drawn from the trough, the operative face of said guide being inclined upward away from the trough, a second guide positioned in alignment with and beyond the delivery end of the first said guide, the operative face of said second guide being gradually reduced in width and inclined upward toward its delivery end, each of said guides being provided with a fluid supply opening in its operative face adjacent the upper end thereof, and independent means for respectively supplying fluid to said openings of the two guides.

FRIEDRICH WILHELM SCHUBERT.