June 9, 1936. O. BOCHMANN 2,043,921

DEVICE FOR SPINNING AND FURTHER TREATMENT OF ARTIFICIAL SILK

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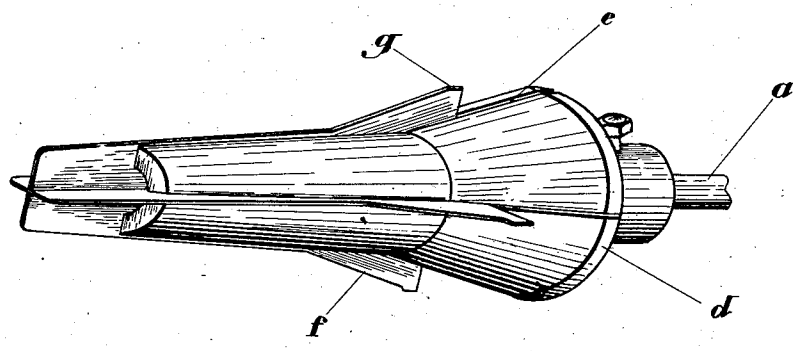
Fig. 1



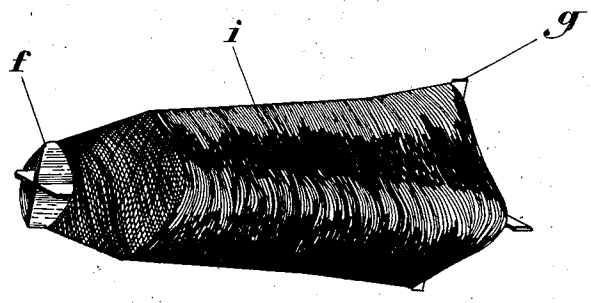


Fig. 2

Fig. 3

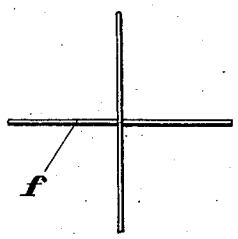


Fig. 4

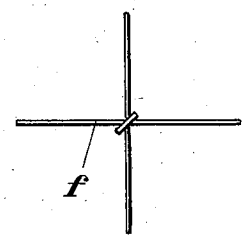
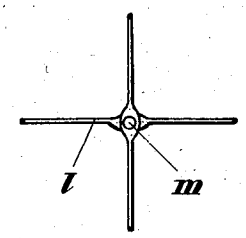


Fig. 5



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DEVICE FOR SPINNING AND FURTHER TREATMENT OF ARTIFICIAL SILK

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Fig.6

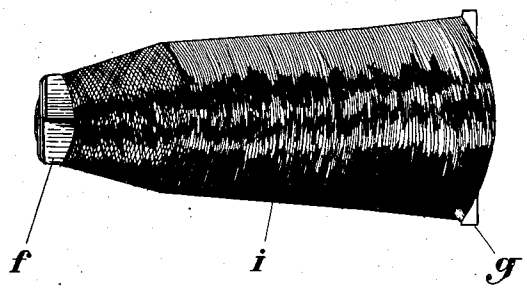


Fig.7

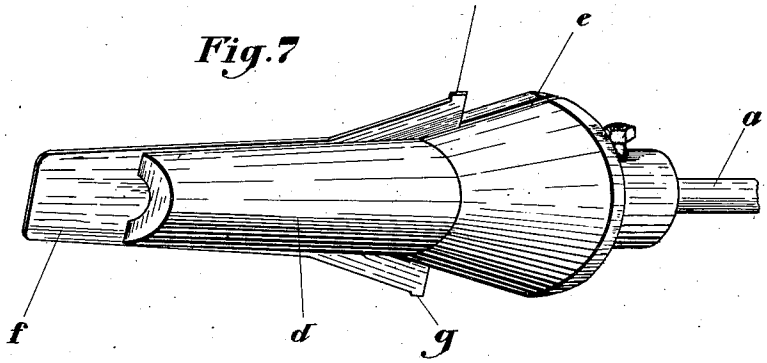
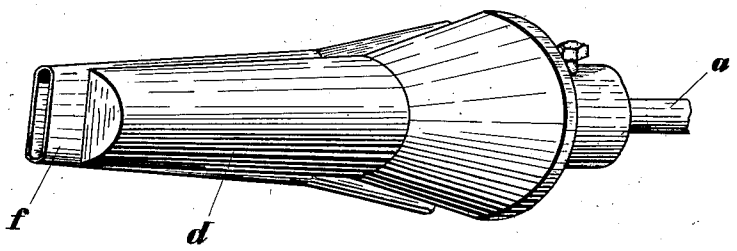


Fig.8



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UNITED STATES PATENT OFFICE

2,043,921

DEVICE FOR SPINNING AND FURTHER TREATMENT OF ARTIFICIAL SILK

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Application April 22, 1931, Serial No. 531,905
In Germany April 26, 1930

12 Claims. (Cl. 18—8)

The invention relates to a device for spinning and further treatment of artificial silk. In the spinning processes heretofore used the spinning material is wound on rigid cylindrical bobbins. In this a drawback arises in that a further treatment of the artificial silk is scarcely possible on this bobbin, as, on the one hand, the further treatment liquids cannot sufficiently penetrate the thread layers, as the latter in their inner surface completely cover the surface of the spool necessitating very long periods of further treatment; on the other hand, the lower layers cannot follow the shrinkages, which take place up to 10% in the further treatment and especially in drying.

In order to take these shrinkages of the silk into account, attempts have already been made to wind the silk on to bobbins, which have a changing or elastic surface. In this again the drawback arises that a proper further treatment of the silk is not possible, as the treatment liquids cannot penetrate the thread layers because of the great surface of the base. Moreover the production of artificial silk is made considerably more expensive by the use of such spools, so that their use comes scarcely in question.

Attempts have also been made to rewind the wound threads in hank form or to wind in hank form in order to subject them to further treatment. This, however, is a somewhat tedious and expensive process, as on the one hand, a repeated re-winding or re-reeling is necessary and, on the other hand, further treatment devices of complicated nature and of great dimensions are needed, whereby the reeling device considerably increases the costs of producing artificial silk.

These drawbacks are removed by the present improvement. This improvement comprises the fact that the spinning material is first wound into a coil of round section and after the termination of the spinning process is withdrawn together with a holding device constructed in the shape of a cross or in a similar non-round form and previously pushed into the bobbin holder, so that then the spinning material layers lie exposed on their inner surface and only fill the chords of the winding circle and in this form can be subjected to further treatment, such as washing, freeing from acid and sulphur, bleaching, drying, dyeing, etc. Furthermore, the spinning material is despatched in this form or the thread is afterwards twisted by pulling off over head.

The advantages of this improvement consist of the fact that the spinning material, wound in the hitherto usual spool form and without being rewound, is subjected to further treatment in this form. The treatment liquids can penetrate everywhere in consequence of the exposed thread layers, so that a proper and intensive further treatment is assured in the shortest time. The thread layers, which only fill up the chords of the winding circle, f. e. four times if a cross shaped holding device is used, are owing to this able to yield to the shrinkages appearing in the further treatment. A further advantage is that the spinning material can also be despatched for working up in this form, or the thread is withdrawn over head for subsequent twisting and brought into the spool shape necessary for working up. By the present improvement a considerable shortening, simplifying and therefore cheapening of the production of artificial silk is achieved.

The object of the invention is to provide a device for carrying out the process. This consists of a spool holder with slots, into which a holding device with non-round cross-section, e. g. constructed in the shape of a cross, is inserted in such a way that it approximately fills the cylinder surface of the slotted spool holder, whereby the holding device has protruding edges at the ends to facilitate its withdrawal together with the spinning material. The cross shaped constructed holding device can consist of strips of paper, metal or similar material pushed into one another, or the holding device is made of two wires crossing each other, which are kept together at the point of crossing by rivets, and externally have the form similar to that of a spool. Apart from the above mentioned advantages of the process the simple construction of the holding device contributes to cheapening the production of artificial silk.

In order to allow a further relaxation of the thread layers when withdrawn from the spool holder, the cross-shaped constructed holding member can also be made collapsible or it can consist only of one strip, which for winding is inserted into a cylindrical spoolholder, which is provided with a slot. This strip can also be made of double folded paper, which for winding is inserted into one slot of a spool holder, or it can be made as a paper tube, pressed flat, which is inserted into the two slots of the spoolholder, in order to enable it being placed on a spool spindle at subsequent untwisting. By means of this type of holding device a complete relaxation of the thread layers is guaranteed, so that this relaxation can take place completely even in large shrinkages. The drawings show the object of the invention in various examples of construction and show:

Fig. 1 the slotted spool holder in perspective with partially withdrawn holding device in the form of a cross

Fig. 2 the ready wound holding device removed from the spool holder, also in perspective

Figs. 3–5 various examples of construction of the cross-shaped constructed holding device

Fig. 6 the ready wound and withdrawn holding device in perspective but in collapsed condition

Fig. 7 the single slotted spool holder, with partially withdrawn holding device in perspective

Fig. 8 the double slotted spool holder with partially withdrawn holding device also in perspective.

On the spool shaft *a*, which is driven by screw wheels not shown in the drawings, there is a spool holder *d*, which is provided with crossed slots *e*. Into these slots *e* a correspondingly cross-shaped holding device *f* is inserted, which shows protruding edges *g* on the ends for facilitating its withdrawal together with the spinning material at the completion of the spinning process. The winding of the spinning material *i* is done in the well known manner by a thread guide moving to and fro. The holding device *f* consists either of strips of metal, paper or similar material (Figs. 3 and 4), which are crossed, inserted into each other or fastened together, or of two wires *l* made into this shape, which are connected with each other at the places of crossing by means of rivets (Fig. 5). For winding the spinning material the cylinder surface of the spool holder is thus approximately filled by the insertion of the cross-shaped constructed holding device, so that the winding of the spinning material is done on to a practically round holder, whereas after the withdrawal of the cross-shaped constructed holding device *f* together with the spinning material a relaxation of the spinning material threads occurs on this holding device, as the layers only fill the four chords of the former circle shape of the spool holder and are completely exposed to the treating liquids at these places. After the further treatment the artificial silk can be despatched on this holding device or can be placed on a slotted spool holder for subsequent twisting or re-winding and the thread removed, whereby the spool holder remains stationary in re-winding or rotates in twisting.

The cross-shape constructed holding device *f* can also be made collapsible, so that a further relaxation of the threads occurs to meet the shrinkages occurring in the further treatment. (Fig. 6.) For further simplification, however, the holding member can be made of one strip, which is inserted into a spool holder provided with one slot (Fig. 7). A further type of the holding device is that this strip is made of paper folded double, or that the holding member is constructed as a paper shell pressed flat, which is inserted into a corresponding doubly slotted spool holder (Fig. 8). In the latter types there are the same advantages as with the collapsible cross-shaped constructed holding device, as a complete relaxation of the thread layers also takes place after the withdrawal of the spool holder.

Having thus described the invention, what I claim is:

1. A receiver for artificial filaments comprising a rotatable member having a portion of its surface at one end thereof raised in relation to the remainder of its surface longitudinally of the member, said rotatable member having a slot extending longitudinally from the end thereof opposite said raised portion and extending through said raised portion, and a holding device adapted to be inserted into and removed from said slot and which is constructed and arranged to support the filaments apart from said rotatable member, said holding device having its outer edges conforming closely to the outer surface of the rotatable member and the raised portion thereof whereby the filaments are supported by the surface of the rotatable member during winding and may be withdrawn from the rotatable member when the holding device is withdrawn from the slot.

2. A receiver for artificial filaments comprising a rotatable member having its lateral cross section throughout a portion of its length at one end thereof greater than throughout the remainder of its length, said rotatable member having slots extending longitudinally therein from the end opposite said portion of enlarged cross section and extending into said portion of enlarged cross section, and a holding device adapted to be inserted into and removed from said slots and which is constructed and arranged to support the filaments apart from said rotatable member, said holding device having its edges conforming closely to the outer surface of the rotatable member whereby the filaments are supported by the surface of the rotatable member during winding and may be withdrawn from the rotatable member and supported upon the holding device when the holding device is withdrawn from the slots.

3. A device as defined in claim 2 in which the surface of the rotatable member is tapered toward the slotted end thereof.

4. A device as defined in claim 2 in which the surface of the rotatable member at the enlarged end thereof is in the form of the frustrum of a cone tapered toward the slotted end of the rotatable member.

5. Device as in claim 1, in which the holding device for the threads comprises a strip of stiff material.

6. Device as in claim 1, in which the holding device, inserted into the rotatable member, consists of double folded sheet-like material.

7. Device as in claim 1, in which the holding device is constructed of wires which cross each other.

8. Device as in claim 1, in which the holding device is constructed of two wires which cross each other and which are held together at their crossing points by rivets.

9. Device for winding an artificial filament comprising rotatable means having an outer surface tapered toward one end and including a plurality of slots extending longitudinally from said end and means adapted to be received in said slots and shaped to closely follow the tapered surface and to extend beyond the same during the winding while permitting the filaments to rest at least in part on said surface, said second-named means being adapted to be removed from the first-named means with the filament mass thereon and being capable of supporting the filament mass.

10. The combination as claimed in claim 9 in which the first-named means is of generally round cross section.

11. A device as defined in claim 9 in which the holding device has a raised portion at the wider end thereof adapted to withdraw the wound filaments from the rotatable member.

12. A device as defined in claim 2 in which the holding device comprises a pair of crossed plates.

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