Nov. 1, 1949 R. L. WORMELL 2,486,903

DRYING OF ARTIFICIAL FIBERS, FILAMENTS AND THE LIKE

Filed Dec. 2, 1948

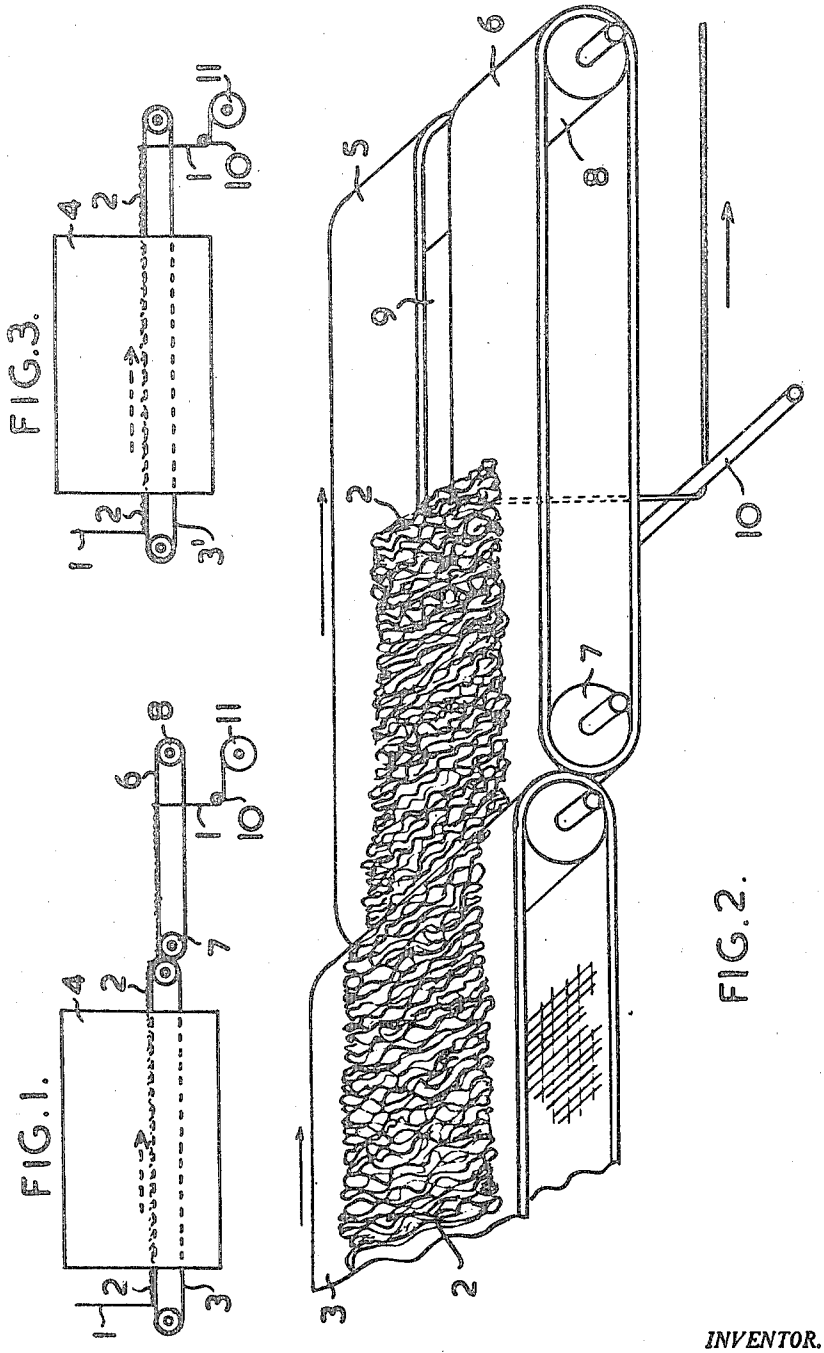

FIG. 2.

FIG. 1.

FIG. 3.

INVENTOR.

Robert Louis Wormell

BY his attorneys

Howson and Howson

Patented Nov. 1, 1949

2,486,903

UNITED STATES PATENT OFFICE

2,486,903

DRYING OF ARTIFICIAL FIBERS, FILAMENTS, AND THE LIKE

Robert L. Wormell, Coventry, England, assignor to Courtaulds Limited, London, England, a British company

Application December 2, 1948, Serial No. 63,096
In Great Britain December 12, 1947

5 Claims. (Cl. 34—23)

1

This invention relates to the drawing of artificial filaments, fibres and like filamentary materials, hereinafter referred to generally as fibres.

In the manufacture of continuous or discontinuous artificial threads, it is known to collect together fibres extruded from a large number of jets into a tow of parallel fibres, to treat the tow with suitable liquids and finally to dry it. The denier of such tows is usually of the order of 10,000 to 200,000. It is known to dry the wet tow by feeding it in convolutions on to a pervious or perforated continuous travelling belt which is moved slowly through one or more drying chambers, the dried tow being finally pulled off the belt and wound into bundles such as crossballs. During the withdrawal of the tow from the belt there is a tendency, particularly with heavy tows, for the tow to become entangled so that a tangled mass builds up which impedes and eventually stops the continuous withdrawal of the tow. In addition, the desired parallel relationship of the fibres may be disturbed leading to the production of neps when the tow is subsequently drawn out into sliver form.

The object of this invention is to reduce the tendency of the fibres in the tow to become entangled when withdrawn from the mass of convolutions.

The present invention comprises a process for drying a continuous tow of artificial fibres by feeding wet tow in convolutions on to a travelling support, conveying the mass of convolutions of the tow whilst on the support through one or more drying chambers, and passing the dry tow at a rate substantially equal to the rate of feed to a collecting device wherein the dried tow is withdrawn from the underside of the mass of convolutions substantially vertically downwards from the underside of the mass of convolutions whilst the mass is supported and being conveyed.

The tow is preferably withdrawn substantially vertically downwards from a conveyor consisting of two endless parallel moving belts lying side by side with a gap between them, the tow being laid across the two belts so that as it is withdrawn it is being taken from each of the belts alternately.

Such a conveyor may constitute the sole conveyor in the drying chamber, but preferably the convolutions of wet tow are carried through the drying chamber on a conveyor of normal construction, such as a woven wire belt, and then, when dry, are passed on to a moving open support from which they are withdrawn substantially vertically downwards according to the invention. In such apparatus two endless conveyor

2

belts lying side by side may be mounted on common driving rollers geared to the drive for the woven wire belt conveyor so that all the conveyor belts move at the same speed. The open support may be arranged a short distance below the woven wire belt conveyor in order to assist in transferring the tow from one conveyor to the other. A transverse rod of glass or other material below the pair of side-by-side belts is preferably provided as a guide for the tow as it is withdrawn substantially vertically downwards between the belts and then led to the collecting device.

The present invention may be applied to the drying of tows of all kinds of artificial fibres such as viscose rayon threads and casein fibres, in continuous or discontinuous lengths. The invention is particularly useful for drying heavy tows for example of the order of 50,000 to 200,000 denier.

The invention also includes apparatus for drying a continuous tow of artificial fibres comprising in combination at least one drying chamber, a travelling support for conveying the tow through the said drying chamber and having an opening through which the tow can pass downwardly, a guide situated beneath the support, and draw-off mechanism for withdrawing the tow at the end of the drying operation through said opening in said support and into contact with said guide.

A preferred form of apparatus according to the invention comprises in combination at least one drying chamber, a travelling support for conveying the tow through the said drying chamber, a second travelling support arranged at the end of the first travelling support for receiving the dried tow and having an opening through which the tow can pass downwardly, a guide situated beneath said second support, and draw-off mechanism for withdrawing the dried tow through said opening in said second support and into contact with said guide. The second travelling support preferably comprises two endless conveyor belts lying side by side with a gap between them, through which gap the tow may be withdrawn substantially vertically downwards.

The present invention is illustrated by way of examples in the accompanying diagrammatic drawings in which,

Figure 1 is a side view of one form of apparatus in which the tow is transferred from a drying belt to a second travelling support from which the tow is withdrawn.

Figure 2 is a view, in perspective, of one end of the drying belt and the open support of the ap-

paratus of Figure 1 with the drying chamber removed, and

Figure 3 is a side view of a further form of apparatus in which the drying belt serves also as the open support from which the tow is withdrawn.

Referring to Figures 1 and 2 of the drawings, a tow 1 is laid in convolutions 2 on a travelling belt 3 which carries the convolutions of tow through a drying chamber 4. The dried tow is then transferred from the belt 3 to a second conveyor formed by two parallel moving belts 5 and 6, both supported and driven by rollers 7 and 8, with a gap 9 between the belts. As shown, the belts 5 and 6 are slightly lower than the belt 3 in order to assist in the transfer of the dry tow from belt 3 to belts 5 and 6. After the convolutions 2 of tow have been carried forward by belts 5 and 6 for a distance at least sufficient to cool the tow, the end of the moving tow is withdrawn substantially vertically downwards through the gap 9, round the transverse rod 10 and then to a crossball collecting device 11. The belt 3 is preferably a woven wire belt such as is normally employed for drying tow. When using two belts 5 and 6 as described, the tow is withdrawn from each of the belts alternately so that the direction in which the tow is pulled on the belts is continually changing.

The driving rollers 7 and 8 are preferably geared to the drive for the belt 3 so that all the belts 3, 5 and 6 are moved at the same speed.

In the apparatus shown in Figure 3 a single conveyor is used, the apparatus otherwise being the same as shown in Figures 1 and 2 and like reference numerals are included to show the corresponding parts. As shown in Figure 3 the tow 1 is fed in convolutions 2 on to a conveyor 3' which consists of two parallel belts preferably constructed in the same manner as the belts 5 and 6 of Figure 2; in this case therefore the tow is withdrawn substantially vertically downwards through the opening in the support 3', round the guide rod 10 and thence to the collecting device 11.

What I claim is:

1. In a process for drying a continuous tow of artificial fibres by feeding wet tow in convolutions on to a travelling support, conveying the convolutions of tow whilst on the support through at least one drying chamber and passing the dry tow at a rate substantially equal to the rate of feed to a collecting device, the step of withdrawing the dried tow substantially vertically downwards from the underside of the mass of convolutions through a gap between two parallel conveyor belts lying side by side whilst the mass is supported and being conveyed on said belts.

2. Apparatus for drying a continuous tow of artificial fibres comprising in combination, at least one drying chamber, a travelling support for conveying the tow through the said drying chamber and having an opening through which the tow can pass downwardly, a guide situated beneath the support, and draw-off mechanism for withdrawing the tow at the end of the drying operation through said opening in said support and into contact with said guide.

3. Apparatus for drying a continuous tow of artificial fibres comprising in combination at least one drying chamber, a travelling support for conveying the tow through the said drying chamber, a second travelling support arranged at the end of the first travelling support for receiving the dried tow and having an opening through which the tow can pass downwardly, a guide situated beneath said second support, and draw-off mechanism for withdrawing the dried tow through said opening in said second support and into contact with said guide.

4. Apparatus as claimed in claim 3 wherein the second travelling support comprises two endless conveyor belts lying side by side with a gap between them, through which gap the tow may be withdrawn substantially vertically downwards.

5. In a process for drying a continuous tow of artificial fibres by feeding wet tow in convolutions on to a travelling support, conveying the convolutions of wet tow through a drying chamber on a travelling support and passing the dry tow at a rate substantially equal to the rate of feed to a collecting device and the steps of passing the tow when dry on to a second moving support having an opening and withdrawing the dried tow substantially vertically downward through said opening from the underside of the mass of convolutions whilst the mass is supported and being conveyed.

R. L. WORMELL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,133,424	Buckwalter	Oct. 18, 1938
2,333,278	Truesdail	Nov. 2, 1943
2,336,019	Kline et al.	Dec. 7, 1943
2,379,824	Mummery	July 3, 1945