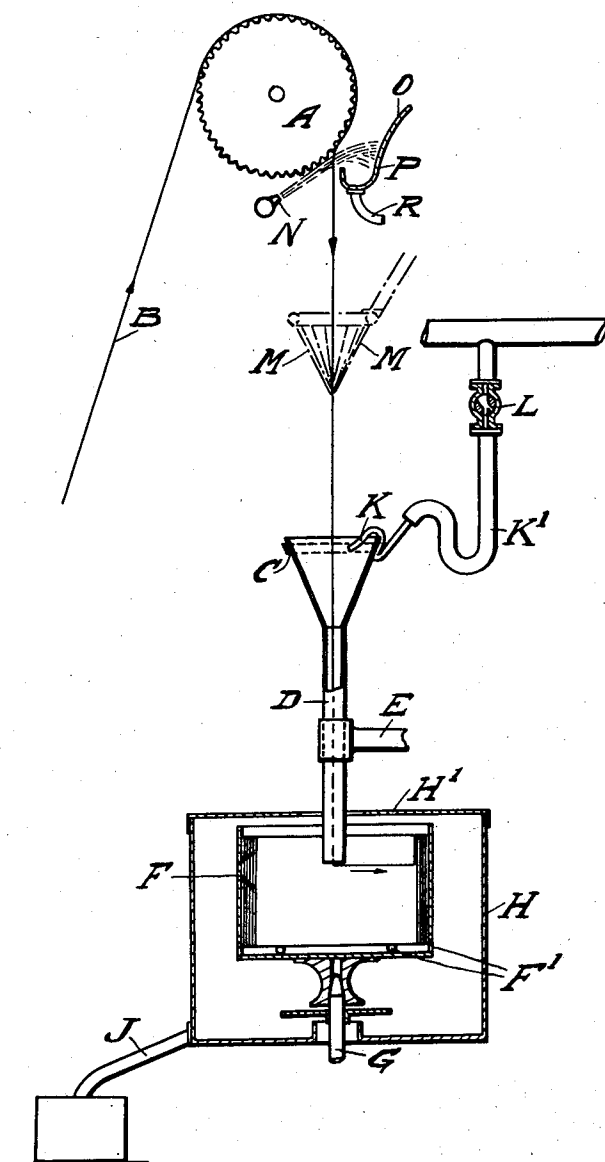


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MANUFACTURE OF ARTIFICIAL THREADS OR FILAMENTS.
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MANUFACTURE OF ARTIFICIAL THREADS OR FILAMENTS.

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To all whom it may concern:

Be it known that I, WILLIAM PORTER DREAPER, a subject of the King of Great Britain, residing at London, England, have
5 invented new and useful Improvements in the Manufacture of Artificial Threads or Filaments, of which the following is a specification.

In the manufacture of artificial threads or
10 filaments where the same are formed by precipitation as in the manufacture of the so-called artificial silk, and where the said threads or filaments are drawn over a revolving drawing-off wheel or godet (herein
15 after referred to as a "godet" and "godet-wheel") after they leave the precipitating bath, the said wheel being of such a nature that the thread is drawn out of the said precipitating bath by friction and then
20 passes down through a so-called open funnel or guider-tube (hereinafter referred to as a "guider" and "guider-tube") of suitable design which delivers the yarn directly into a centrifugal box where the strand is col-
25 lected and spun, certain difficulties in procedure may be overcome in the following manner:—

By the means now to be described an extension of the ordinary limits of size of the
30 said threads or filaments may be secured and certain other advantages gained at the same time in the process of manufacture.

In the present invention the threads or filaments are formed in the usual manner in
35 a precipitating bath or otherwise, from which they pass over the godet and then down through an open funnel guider tube into a centrifugal box, and according to the said invention, the threads or filaments as
40 they pass down the said guider are subjected to the action of a constant stream of a suitable solution or liquid this operation being preferably effected by means to be described.

The effect of this continual stream of a
45 solution or liquid down the said guider is to facilitate the progress of the thread down the same and to prevent it sticking to the sides of the same. Also a further part may be played by this stream when it acts chemi-
50 cally or physically on the already formed thread or filaments. The liquid or solution which is passed down the open guider during the whole time of spinning may be of the same nature as the precipitating bath
55 when this is used, or it may differ from the same in strength or nature as this may be

desired. For example when water is used, and the thread is subjected at this early stage of manufacture to a continual washing process in the said guider and also in the cen-
60 trifugal box, since the solution passes down into the centrifugal box, a distinct advantage is obtained in certain cases by removing the surplus of soluble salts from the filaments and so the danger of subsequent crystalliza-
65 tion of the salts in the filaments is prevented.

Thus the thread, yarn, or strand is continually subjected to a further action of a selected solution or liquid, and also the pas-
70 sage of the said thread down the open guider is facilitated during the whole period of production, which may in some cases extend for, say, two hours before the centrifugal box is sufficiently filled with the twisted and
75 coiled yarn. The effect of this treatment is so to facilitate the spinning operations that a finer thread can be spun and dealt with than can be conveniently operated in the
80 absence of this stream of liquid down the inner side of the guider. More particularly a thread of lesser weight or strength may be operated by such means without physical injury to the individual filaments of which it
85 may be composed, and production may also be conducted at a greater speed. At the same time the thread is specially treated with a selected solution or liquid as may be de-
sired.

In the accompanying drawing, I have shown diagrammatically how the invention
90 may be carried into practice:—

In this drawing, A is the godet or draw-
ing-off wheel which receives the freshly-precipitated thread or filament B. C is the
upper funnel-shaped end of the guider,
95 which has a tubular stem D. The guider C, D is supported on a bracket E which is reciprocated vertically in any suitable known manner so as to distribute the thread
100 or filament issuing from its lower end uniformly over the peripheral wall of the centrifugal box F which is perforated at F' and is detachably mounted in a known manner
on a vertical driving shaft G and surrounded
105 by a box or shield H which receives the solution or liquid thrown off. This box is provided with a detachable cover H' and with a drain J for enabling the solution
or other liquid to escape.

To carry out this invention a small glass
110 or other tube K, for instance, may be so attached to the upper funnel or bell-shaped

end C of the guider that it may deliver a stream of the selected solution or liquid in the required manner into the said guider and preferably so that as large a surface as possible of the inner side of the guider is continually washed with the same solution. To effect this, the stream of liquid may be suitably directed on to the surface of the guider at such an angle and with such a force that it swirls round the funnel- or bell-shaped end of the guider and thus wets as much of the surface of the same as is possible before it enters the lower and stem like or tubular part of the guider. Thus the inner surface of the guider is continually flooded with a stream of the solution used which then passes down the guider with the thread or yarn and facilitates the progress of the latter as it passes through the guider stem D. By this or equivalent means the thread or filaments are subjected to the action of a constant flow of solution in the said guider during the whole period of spinning in an automatic manner, and the process of manufacture is correspondingly facilitated, or even rendered possible in the case of finer threads or filaments than those ordinarily obtained by the centrifugal method of spinning such yarns or filaments. It is also possible when using this method of working to secure satisfactory results where the speed of the centrifugal box F is not in itself sufficient to draw down by its own effect the thread through the open guider.

The other end of the tube K supplying the stream of liquid to the guider may be attached to a common supply pipe by a flexible tube K', such as a rubber one, in such a way that the up and down motion of the guider is not interfered with and also the direction of flow is kept constant.

By preliminary trial, a suitably sized tap to control the actual flow of liquid is also fitted to this branch supply pipe and this is used to control the actual flow of liquid to the guider. Working with constant pressure of solution a tap L may be selected of such a bore that when fully turned on it delivers the desired amount of solution to the funnel guider. By using a two-way tap of suitable design with two thoroughfares of different cross-sectional areas an additional flow of solution may be arranged for when this is temporarily desired, e. g. when the thread or filament is being introduced into the guider tube.

Under certain circumstances an advantage is also secured by arranging the flow of liquid so that it first comes into contact with the descending yarn at a point above the the upper end of the guider but on the guider side of the godet. By this means the thread is weighted with liquid and as a consequence the first end may then even pass down the said open guider without actual handling. The exact conditions which allow of this can only be determined by trial in the first place. The stream of liquid may even be divided up into two or more jets coming from different directions into the normal path of the descending yarn as it passes down from the godet to the guider, for example from a perforated annular tube as shown in chain lines at M, M. This tube M preferably does not extend entirely around the filament, so as to leave a lateral gap through which the filament can be introduced when starting the apparatus in operation. Again a stream can be arranged to play against, or touch, the falling thread at a point immediately where it leaves the surface of the godet, as shown at N so that it facilitates the leaving of the thread from the godet surface by weighting the same. This jet may be supplementary to either of the jets above mentioned. O is a screen for catching any liquid that may be thrown off the filament and conducting it to a gutter P and drain R.

The solution which is supplied in the manner indicated subsequently falls into the centrifugal box F with the thread and is then thrown off from the same by centrifugal action. It is then collected from the outer box or shield H which always surrounds these boxes and is suitably carried off at J and stored for re-use or special treatment for the recovery of substances contained in the same, as may be desired. Thus the washing action is also automatically extended to the region of the said box and the yarn is also subjected to its action here as well as in the guider, or just above it. As previously explained this action may be physical, or chemical, or both as may be desired.

In special cases this treatment in the guider may be supplemented by a further treatment which immediately precedes the actual drying operation as this is carried out in practice.

This further treatment when resorted to may be given to the yarn when it is in the skein form and prior to the actual drying of the same. It is intended in combination with the previous treatment to protect the filaments still further from damage while they are drying under strain. To effect this further treatment, the yarn preferably in skein form is treated with a solution of a soap, soluble oil or other substance which will prevent the filaments from sticking together or breaking under the said strain. This process may be followed by a washing process after the skeins are thoroughly dried, if this is desired.

What I claim is:—

1. A process of spinning precipitated artificial threads, filaments and the like, consist-

ing in that the product of precipitation is subjected to the action of a constantly flowing stream of liquid as it is guided into a receptacle under the action of centrifugal force exerted thereon in such receptacle.

2. A process of spinning precipitated artificial threads, filaments and the like, consisting in that the product of precipitation is subjected to the action of a constantly flowing stream of liquid as it is guided along a course and into a receptacle under the action of centrifugal force exerted thereon in such receptacle, the liquid being applied to and guided about the product of precipitation along parts of the course.

3. A process of spinning precipitated artificial threads, filaments and the like, consisting in that the product of precipitation is subjected to the action of a constantly flowing stream of liquid which has a helical motion around the product of precipitation as the latter is drawn along a course and guided into a receptacle under the action of centrifugal force exerted thereon in such receptacle, the liquid being applied and guided to the product of precipitation obliquely to its course.

4. A process of spinning precipitated artificial threads, filaments and the like, consisting in that the product of precipitation is subjected to the action of a constantly flowing stream of liquid as it is guided into a receptacle under the action of centrifugal force exerted thereon in such receptacle, the liquid being applied and guided to and confined in the region of the product of precipitation and the rate of flow of the liquid being temporarily increased when an end of the product of precipitation is being introduced into the said region.

5. In a process of spinning precipitated artificial threads, filaments and the like, of the kind wherein the product of precipitation is fed towards a receptacle from a godet wheel and is drawn and guided through a protected region into such receptacle by centrifugal force exerted thereon in the receptacle, the treatment of the product of precipitation by constantly flowing liquid supplied thereto adjacent to the godet wheel and at the upper end of the protected region.

6. In a process of spinning precipitated artificial threads, filaments and the like, of the kind wherein the product of precipitation is fed towards a receptacle from a godet wheel and is drawn from the godet wheel through a region in which the filaments are protected and into such receptacle by centrifugal force exerted thereon in the receptacle, the treatment of the product of precipitation by a constantly flowing stream of liquid supplied thereto as it passes from the godet wheel to the receptacle, and recovering the liquid after passing through said receptacle.

7. In a process of spinning precipitated artificial threads, filaments and the like, of the kind wherein the product of precipitation is fed towards a receptacle and is drawn through a protected region into such receptacle by centrifugal force exerted thereon in the receptacle, the treatment of the product of precipitation by a constantly flowing stream of liquid supplied thereto as it passes along its course to the receptacle, the product being then treated with a further liquid.

8. In a process of spinning artificial threads or the like, wherein the filament is passed along a course and is drawn and wound into a receptacle by centrifugal force, the filament being passed through a protected region at the entrance of which the filament is subjected to the influence of a helically moving stream of liquid.

9. In a process of spinning artificial threads or the like, wherein the filament is passed along a course and is subjected to the influence of constantly flowing streams of liquid, the filament being passed through a protected region throughout which the filament is subjected to the influence of a stream of helically moving liquid confined to the region of said filament and is drawn into a receptacle and wound over a region therein by centrifugal force.

10. The process of spinning precipitated artificial filaments and the like, consisting in leading the product of precipitation from a source along a course, submitting the same to centrifugal influence, and subjecting the filament to a constantly flowing stream of liquid while passing from said source to the place where said centrifugal influence is brought to bear on the filament.

11. The process of spinning precipitated artificial filaments and the like, consisting in passing the product of precipitation from a source to a region where it is subjected to the influence of centrifugal force, and subjecting the filament in passage to a constantly flowing stream of liquid.

12. The process of spinning precipitated artificial filaments and the like, consisting in passing the filament from a source of material to a centrifugal influence and submitting said filament in passing to the influence of liquid played on the filament at a plurality of places in its course between the source and centrifugal influence.

13. The process of spinning precipitated artificial threads, filaments and the like, consisting in passing the product of precipitation from a source by rotarily impelling the filament along its course, winding the filament by centrifugal force and submitting the filament in course of passage from the source to the centrifugal winding influence to a constant stream of liquid.

14. The process of spinning precipitated artificial thread, which consists in drawing

a thread from rotary guiding means, submitting the filament to a constant stream of liquid, and subjecting the thread to a guiding and centrifugal force whereby it is wound evenly over a limited area. 5 and submitting said filament to the action 10 of a constant stream of liquid in course of passage and to guiding and centrifugal influence for winding the thread in said receptacle.

15. The process of spinning precipitated artificial thread, filaments and the like, which consists in passing a filament along a course from a godet wheel to a receptacle,

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Witnesses:

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