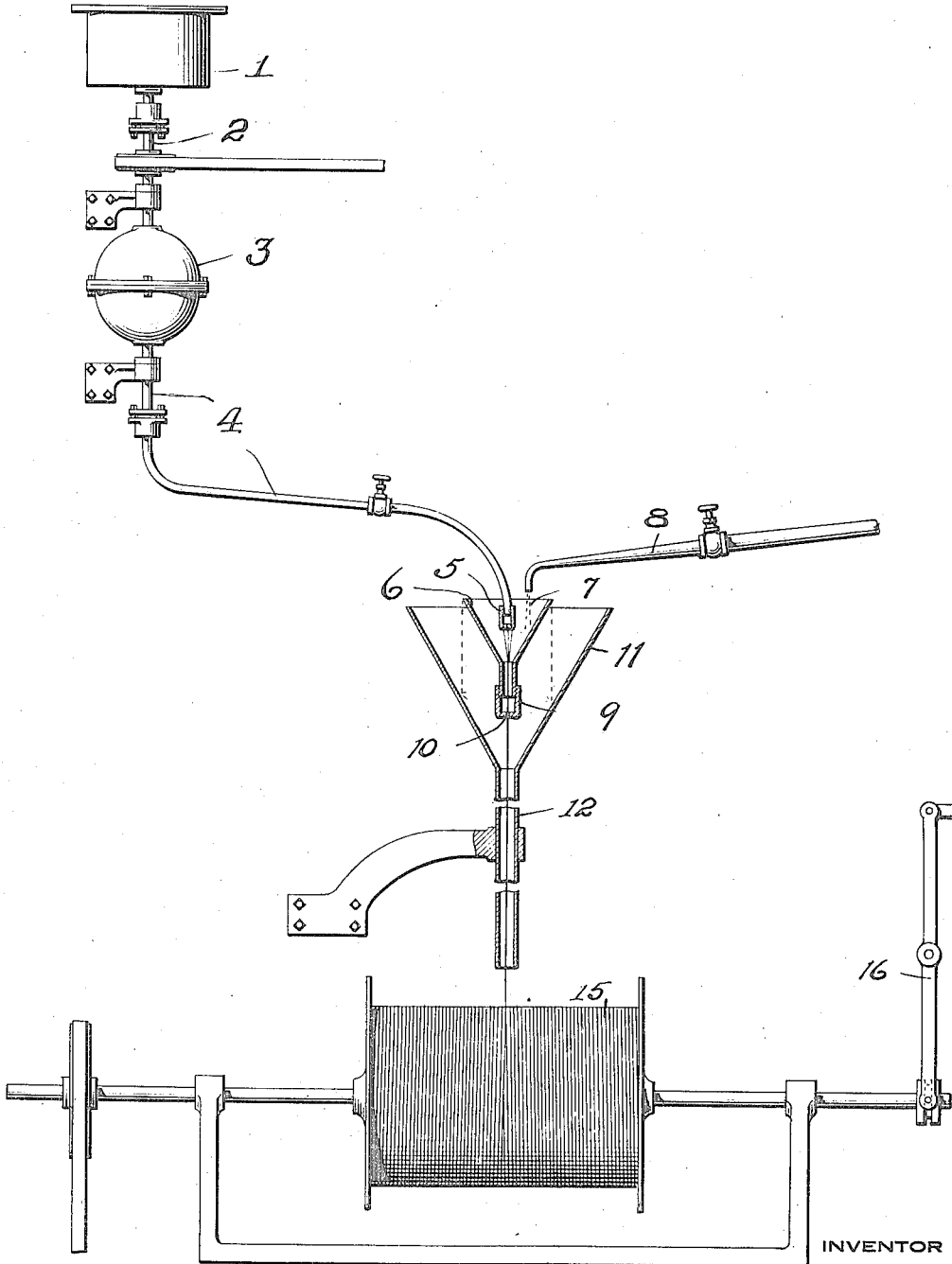


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APPARATUS FOR MAKING THREADS.
APPLICATION FILED JULY 10, 1914.

1,202,766.

Patented Oct. 31, 1916.



WITNESSES

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES SCOTT ALTHOUSE, a citizen of the United States, residing at Reading in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Making Threads, of which the following is a specification.

This invention relates to apparatus for the manufacture of filaments or threads from cellulose solution, and the object in the present instance is to provide means whereby the solution is cleansed by centrifugal action during its passage from the source of supply to the forming nozzle.

A further object is to provide means for accomplishing this cleansing without altering the pressure at which it is fed to the spinning nozzle, so that the pressure at the source of supply and at the nozzle will at all times be the same, that is to say, the pressure at the nozzle will be positively determined by the pressure at the source of supply. Heretofore filtering devices have been used between these two points, but they have necessarily altered the pressure, so that there was no certainty of the amount of pressure at the nozzle. Devices for overcoming this reduction or altering of the pressure have been used in connection with such filters, but I find that the interposition of a centrifugal separator in the supply, between its source and the nozzle, will thoroughly cleanse the solution and still permit the flow from one point to the other without effect on its pressure, and without the consequent addition of any device for overcoming such effect.

Another object in the present instance, is to provide means for properly "drawing" the thread as it emerges from the spinning nozzle. It is understood that the viscosity of the solution is such that the strands emerging from the nozzle are much heavier than is desired, and that it is necessary to "draw" them to the requisite fineness. This has usually been accomplished wholly or in part by the winding drum during its winding action, and it has been attempted also by the use of a funnel or tubes in which liquid has been employed to produce the desired result.

In my present device, I provide two funnels, in one of which the setting liquid produces the desired action on the thread as it emerges from the spinning nozzle, and in

which the additional function is performed, of "holding back" the thread by the volume of said setting liquid, while in the other funnel the drawing of the thread is produced by the passage therethrough of the thread together with a certain flow, at a relatively greater speed, of the said liquid, so regulated as to produce the maximum "pull" on the thread, which maximum is attained by keeping the volume of liquid somewhat less than sufficient to fill the tube to capacity, so that the "hold back" exerted in the one funnel and the "pull" produced by the relatively rapid flow of the liquid through the other, will effect the desired reduction in the size of the thread, and the winding reel will perform only its usual function of winding the thread and will exert no "drawing" effect on it, thus overcoming one of the great tendencies to break the thread.

The invention is clearly described in the following specification, and the apparatus fully illustrated in the accompanying drawing, which illustrates a simple form of apparatus for carrying out my present invention.

In the drawing: The numeral 1 designates the source of supply, shown in the form of a suitable container for the solution, which is provided with an outlet 2, leading to and communicating with a centrifugal separator 3, into which the solution enters and in which it is cleansed by centrifugal action, and by which foreign substances are eliminated therefrom. This separator may be formed in separable parts for convenience in removing the said foreign substances or particles thus separated, and which are temporarily retained in the separator while the cellulose solution, after being cleansed, passes through it without increased or diminished resistance.

The outlet from the separator, indicated by the numeral 4, is shown in the form of a tube, to the extremity of which is attached a forming nozzle in the form of a perforated cap 5, from which emerges a plurality of filaments, which, when combined, form the thread. This nozzle is located within the open end of a funnel shaped device 6, and is surrounded by a setting liquid 7 which enters the funnel through a supply pipe 8.

The funnel is provided at its lower extremity or outlet, with a removable cap 9 and this cap is provided with a contracted lower end, providing a relatively small open-

ing 10 through which the setting liquid together with the thread formed of the solution, passes. The funnel 6 is kept filled with the setting liquid, so that the thread at its initial formation, by the joining of the filaments as they emerge from the nozzle, will get the full effect of the setting liquid, while at the same time the said liquid will tend to "hold back" the thread in its passage through the small opening 10 in the cap 9.

The setting liquid supply is regulated so that there is a slight overflow in this funnel, which overflow, together with that portion of the liquid which passes through the outlet 10, will act as a conveying medium for the thread as it passes toward the winding reel, 15.

Surrounding the funnel 6, and immediately below it, is located a relatively larger funnel 11, terminating in a tubular member 12 whose capacity is greater than the combined discharge from, and overflow of, the funnel 6, so that, while the smaller funnel 6 is constantly filled with the liquid, the tubular member 12 is only partially filled, and, as it passes down this tube, the liquid imparts a pulling effect on the thread, which, together with the resistance offered by the liquid in the smaller funnel 6, results in the desired formation of the thread.

The outlet from the tube 12 leads preferably to or toward a winding reel 15 for the thread, and this reel may be provided with any simple means for passing it horizontally across the mouth of the opening in the tube 12 so that the winding may be properly effected. This means of moving the reel is indicated in the drawing by a lever 16 connected to the shaft of the reel, and reciprocatory movement may be imparted to this lever in any well known manner (not shown). It must be remembered that the viscosity of the solution used in apparatus of this character is such that thorough cleansing is required before it can be successfully spun, and, it has been found in practice that to cleanse the solution prior to its entrance to the source of supply, which is usually a container of some description, will not suffice. It has been found necessary to perform the cleansing immediately prior to its admission to the spinning nozzle, and when this cleansing has been accomplished by the use of porous filters, such as are commonly used, the pressure at which it enters the nozzle is so varied that good results have not been attainable.

With the centrifugal separator, applied as shown, the solution is cleansed without in the least altering the given pressure of the solution, so that the pressure at the spinning

nozzle may readily be determined or regulated at the source of supply.

I am aware that other tubular and funnel shaped devices have been used in attempting to accomplish the result which I have attained, but in none of them is the drawing effect produced on the thread entirely by the flow of the setting liquid in a two funnel structure such as I have shown and described.

What I claim is:

1. In apparatus of the character described, a source of supply, a forming nozzle, and a centrifugal separator interposed in the line between the source of supply and the forming nozzle, whereby the solution passing through the line will be cleansed without effect on its flow.

2. In apparatus for manufacturing threads from cellulose solutions, a source of supply, a forming nozzle from which the solution emerges in filaments, a funnel, means for retarding the discharge from said funnel, means for introducing a setting liquid in said funnel surrounding the nozzle, and a second funnel adapted to receive the thread and the liquid from said first named funnel, said second funnel having an outlet of greater capacity than the volume of liquid entering it, whereby a pulling effect is produced on the thread as it passes through said funnel.

3. In apparatus of the character described, a funnel, a removable cap for retarding the discharge from said funnel, and a second funnel of greater capacity than the first named funnel adapted to receive the product of the apparatus together with the discharge from said first named funnel and to discharge it at a speed greater than the discharge from the first named funnel.

4. In apparatus for forming threads from cellulose solutions, a source of supply, having an outlet; a separator in communication with said outlet; an outlet from the separator; a forming nozzle on the end of said separator outlet; a funnel into which said nozzle discharges; means for introducing a supply of setting liquid leading to said funnel; a second funnel located below the first named funnel adapted to receive the discharge from the first named funnel, and a relatively large outlet from said last named funnel whereby the passage therethrough of the discharge is accelerated.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SCOTT ALTHOUSE.

Witnesses:

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