

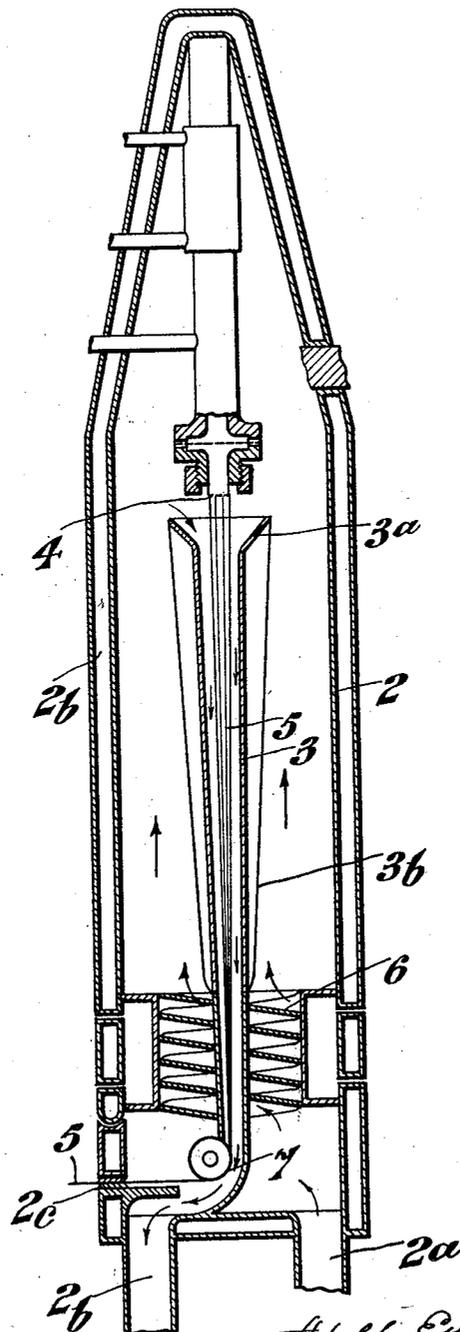
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MANUFACTURE OF ARTIFICIAL SILK

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MANUFACTURE OF ARTIFICIAL SILK

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This invention relates to the manufacture of artificial silk and particularly to the process known as dry spinning.

In the dry spinning process which is well known artificial silk is manufactured by the extrusion of filaments or threads of cellulose acetate or other cellulose derivatives through nozzles into a chamber in which a stream of air or any other suitable gas heated to a suitable temperature serves to dry the threads and carry away the evaporated solvent.

Usually the threads are extruded downwardly and the stream of air or gas is directed upwardly, an arrangement which is known as counterflow.

While this arrangement has the advantage that the threads when reaching the lower part of the extrusion cabinet, at which stage they are already fairly dry, meet with the driest part of the air or gas stream and therefore the evaporation of the remaining solvent takes place under more favourable conditions, this arrangement has the disadvantage that the stream tends to carry the threads upwards in the case of a break which causes complete entanglement of the threads.

The present invention consists of artificial silk manufacturing apparatus in which the extruded threads are subjected to the action of a current of air while passing through a drying chamber, wherein the current of air is passed through the drying chamber in the same direction as that in which the extruded filaments are moving. Means may be provided whereby the velocity of the current of air leaving the drying chamber will be greater than that entering it, and this increase in velocity may be arranged to be gradual. To effect this increase in velocity the current of air and the threads may be arranged to pass through a conical tube or other tube of gradually decreasing cross sectional area.

A manner of carrying out the invention is illustrated by the accompanying drawing which is a sectional view of the extruding and drying chamber.

In the drawing 2 is the main drying chamber having an insulating jacket 2*b*, and in the centre of which is provided a tube 3 through which the threads 5 extruded from

the jet nozzle 4 pass downwards together with a stream of air or gas. The tube 3 is of conical shape so as to ensure constant acceleration of the stream of air or gas passing through it.

The tube 3 has an enlarged open upper end 3*a* to admit air passed from an inlet 2*a* up through a heating device 6 and the annular space between the vessel 2 and the tube 3, and is provided with radiating ribs 3*b*. The air passing through the tube 3 leaves the apparatus by an outlet 2*b* and is circulated by a fan or any other suitable means through a solvent recovery plant.

At the lower end of the tube 3 the filaments 5 pass under a guide pulley 7 and through a lateral outlet 2*c* to any suitable collecting device.

In this apparatus the downward stream of air in the central tube 3 tends to carry the threads 5 with it, and in the case of a broken thread no entanglement takes place because the ends are blown downward and through the opening 2*c* to the apparatus arranged outside the cabinet where they can be readily collected and re-arranged.

The acceleration of the air or gas stream has the effect that in the lower part of the tube 3 the air or gas moves at a higher speed, and the inclination of the sides of the tube 3 can be made such that the evaporating effect will remain constant all along the tube and thus the same effect will be attained as with the upward stream of air.

At the bottom end of the central tube 3, the stream carrying the plurality of threads 5 can be utilized to pass the filaments or threads through any suitable device of a rotary type adapted to twist the threads together so that at the exit 2*c* from the cabinet the threads appear as a single twisted thread ready for any other operations such as winding on bobbins or whatever is required in any specific case.

What I claim and desire to secure by Letters Patent is:—

1. Apparatus for the manufacture of artificial silk by the dry spinning process comprising a drying chamber, a filament extrusion nozzle within the upper portion of the

chamber, a gas inlet in the lower end of the drying chamber, a gas outlet also in the lower end of the drying chamber, a central tube within the chamber, a heater for the gas in the drying chamber, the upper end of the tube being open to the gas space within the chamber while the lower end of the tube forms an outlet for the filaments and the gas at the lower end of the chamber, the central tube being of gradually decreasing cross sectional area throughout its length, and the gas heater arranged on the outside of the central tube.

2. Apparatus for the manufacture of artificial silk by the dry spinning process, comprising a drying chamber, a filament extrusion nozzle within the upper portion of the chamber, a gas inlet in the lower end of the drying chamber, a gas outlet also in the lower end of the drying chamber, a central tube within the chamber, a heater for the gas in the drying chamber, the upper end of the tube being open to the gas space within the chamber while the lower end of the tube forms an outlet for the filaments and the gas at the lower end of the chamber, the central tube being of gradually decreasing cross sectional area throughout its length, and the gas heater arranged at the lower end of the drying chamber.

3. Apparatus for the manufacture of artificial silk by dry spinning process, comprising a drying chamber, an insulating jacket surrounding said drying chamber, a central tube within the chamber, a nozzle within the upper portion of the chamber for extruding filaments into said central tube, an inlet and outlet for the drying gas, means whereby the drying gas can be passed through said central tube in the direction of movement of the filaments, means within the chamber for heating the drying gas, a lateral outlet for the dried filaments near the lower end of the chamber, and a filament guiding pulley, the said central tube being of gradually decreasing cross sectional area throughout its length and the pulley arranged at its lower end so that the dried filaments can pass through the lateral outlet, while the drying gas passes through the gas outlet, independent of the filament outlet.

In witness whereof I affix my signature.
ADOLF EWALD GULL.

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