Sept. 4, 1928. 1,683,055

J. A. ROUX

PROCESS AND APPARATUS FOR PRODUCING FILAMENTS

Original Filed Oct. 6, 1921 2 Sheets-Sheet 1

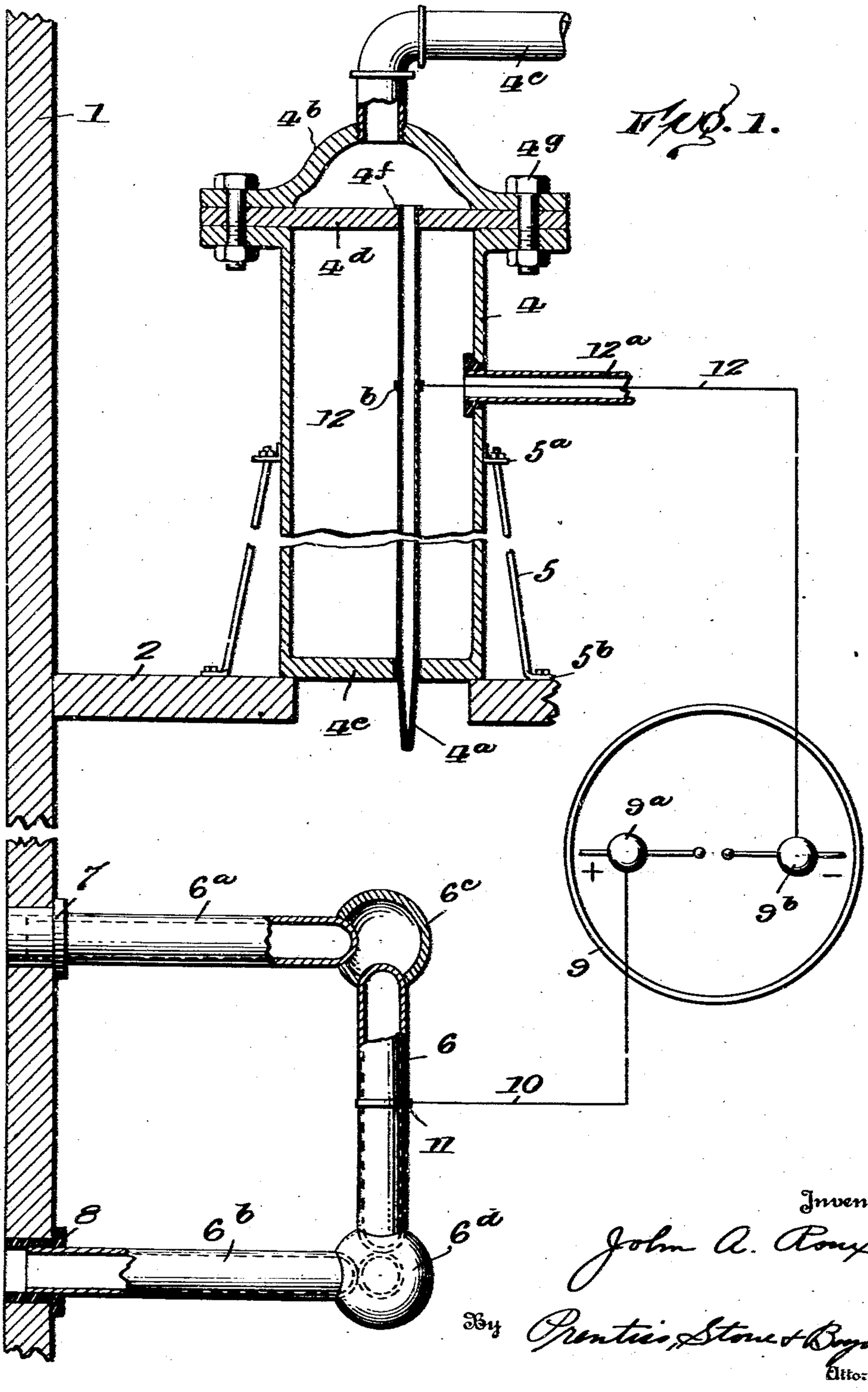

Fig. 1.

Inventor
John A. Roux.

By Prentiss, Stone & Bryden
Attorneys

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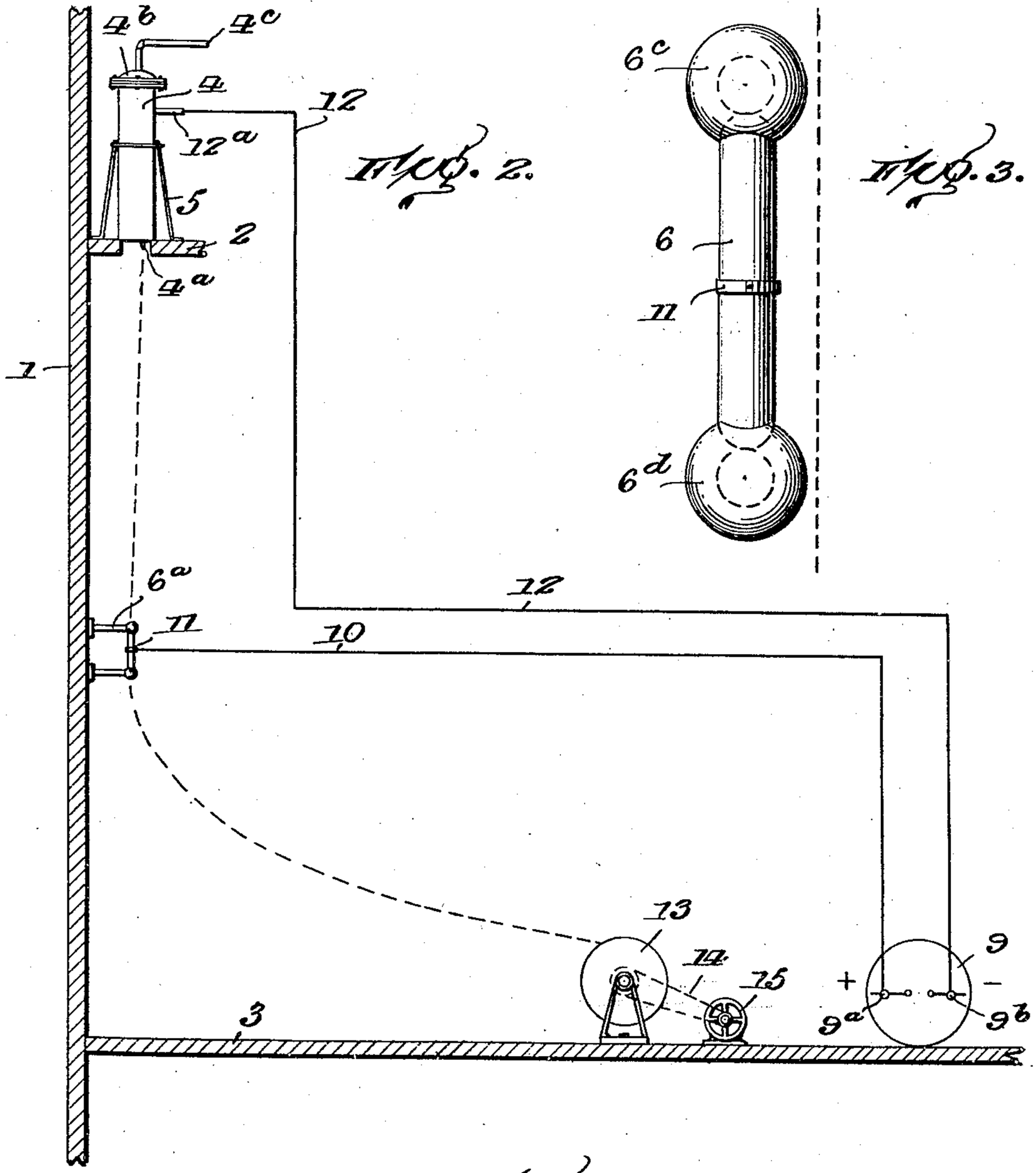

Fig. 2.

Fig. 3.

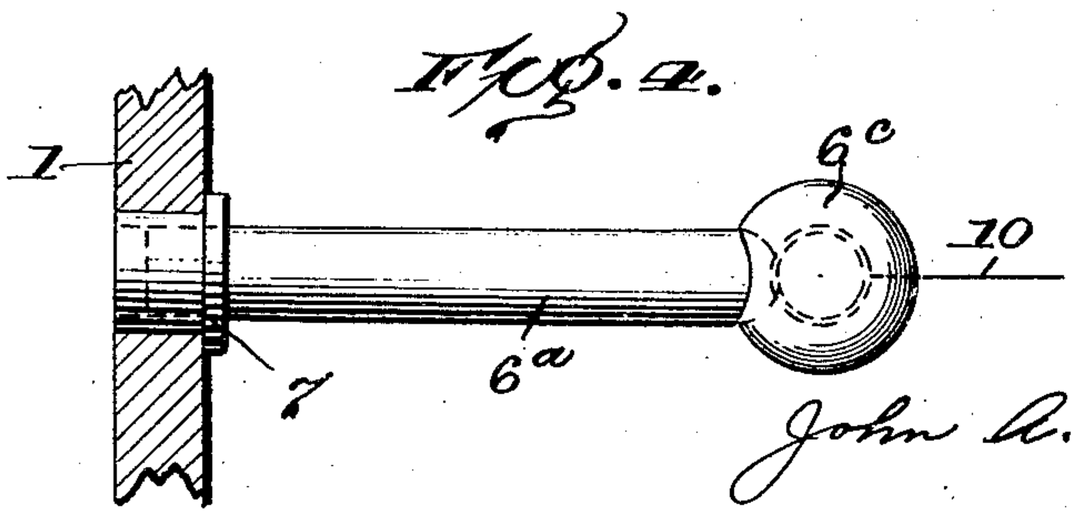

Fig. 4.

Inventor

John A. Roux.

By Prentiss, Stone & Boyden

Attorneys.

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UNITED STATES PATENT OFFICE.

JOHN ANDRÉ ROUX, OF TENAFLY, NEW JERSEY.

PROCESS AND APPARATUS FOR PRODUCING FILAMENTS.

Application filed October 6, 1921, Serial No. 505,953. Renewed November 18, 1927.

This invention relates to the production of continuous lengths of material by expressing a semi-liquid material from an orifice and drying it.

One of the objects of the invention is to provide a process and the apparatus therefor by which filaments may be formed at a relatively high rate of speed; the uniformity of size throughout the length is maintained; and the quality of and strength of product made remarkably perfect.

Features of the invention relate to the special apparatus used and the relative arrangement of the parts of this apparatus, whereby material treated is introduced into a particular expressing apparatus and subjected thereafter to a particular electric treatment during its transformation into the completed product.

In the present embodiment, process and apparatus relate particularly to the production of an artificial filament and artificial silk, which product possesses to an unusual degree the desirable qualities of natural silk. One particularly important result of the present invention is the production of an elastic stretchable artificial material.

Other advantageous features are described and claimed in the following specification and claims, and illustrated in the accompanying drawings in which:

Fig. 1, is an elevation in partial section showing the polarizer below the spinneret tube;

Fig. 2, is a view showing an elevation the relative position and size of the casing enclosing the spinneret tubes, the polarizer beneath the casing and the relative position taken by the filament in course of manufacture;

Fig. 3 is a front view of the polarizer frame showing the relative position of the filament along side thereof; and—

Fig. 4 represents a top view looking down on the polarizer and showing the manner of mounting of the ends of the polarizer frame in the supporting wall.

Referring in detail to the drawings, 1 indicates a vertical wall of a building or other suitable support. 2 represents the floor of the building or other suitable laterally extending support, and 3 represents a similar floor positioned about twelve feet below the floor 2. Mounted on the floor 2 and positioned over a suitable opening therein is a spinneret cylinder hereinafter mentioned and claimed as the spinneret tube enclosing casing 4. This casing is supported firmly in an upright position by means of the supporting brackets or braces 5 reaching from the support 2 upwardly to an encircling clamp about the casing, the clamp being indicated at 5^a and the lower ends of the supporting arms being indicated at 5^b in Fig. 1. The casing 4 is preferably made of aluminum sheeting having side walls of $\frac{1}{4}''$ stock. Positioned vertically within the casing are a series of spinneret tubes 4^a having discharge orifices at their lower ends. In Fig. 1 one of these tubes is shown in section within the casing with the lower end projecting downwardly below the casing. A cover 4^b for the casing is formed of aluminum of a thickness of $\frac{1}{2}''$, and in the top of the cover plate 4^b is an opening for the reception of the intake pipe 4^c, through which latter material to be expressed is admitted to the casing. At the top of the vertical walls of the casing 4 and resting on the laterally extending annular flange formed continuous with the wall is an upper spacing plate formed of $\frac{1}{2}''$ aluminum and which is perforated for the reception of the tubes 4^a as will be described. The bottom of the casing is provided with a $\frac{1}{2}''$ wall 4^e which is likewise perforated with holes to correspond with the openings in the plate 4^d. Corresponding openings in the two plates are brought into alignment by adjustment of the plate 4^d with respect to the casing and before the top cover 4^b is finally secured. Each spinneret tube 4^a is made of aluminum rolled evenly to have an outside diameter of $\frac{1}{2}''$. The length of the tube corresponds to the length of the casing and projects downwardly beyond the casing floor for a distance of $2''$, gradually tapering from the bottom of the casing to the tip of the tube. The lower end of the tube is drilled to provide the proper size opening, and the opening provided by a No. 64 drill, providing an opening of about $\frac{1}{32}$ of an inch, has been found satisfactory. The top part of the spinneret tube is provided with an annular flange 4^f which rests on the upper surface of the spacing plate 4^d and is rolled thereon and soldered to make a tight fit, or otherwise provided with a liquid tight fit in the spacing plate. After the spacing plate 4^d and the tubes 4^a are in their proper positions, the top

cover 4^b is clamped to the flange on the casing by means of suitable bolts 4^g, thus securing the spacing plate 4^d between the flange and the top cover. In the form illustrated, the inside of the casing has the following dimensions and the other parts shown in Fig. 1 and Fig. 2 are drawn substantially to scale. The inside of the casing is 28″ high and the diameter is 5½″. The top flange on the casing 4 is about 1″ wide. The top cover 4^b is about 4″ deep at the central point, tapering to the inside dimensions of the casing, and on the outside tapering to the flange of the casing. Eight clamping bolts 4^g are used for clamping the top cover and spacing plate to the cylinder.

One of the particular features of the invention is the particular construction of the polarizer member and its relative position with respect to the casing 4. As shown in the drawings, the polarizer is formed as three sides of a tubular frame, substantially as three sides of a rectangle. The front side is formed by a tube 6 which is mounted in alignment with the central axle line of the casing 4. The top side of the polarizer is formed by the tube 6^a, and the lower side of the polarizer is formed by the tube 6^b, and both sides 6^a and 6^b are held rigid with respect to the front side 6 by being mounted in the metal balls 6^c and 6^d respectively. The extreme ends of the parallel members 6^a and 6^b are supported in the wall 1 and are preferably insulated therefrom by suitable hard rubber sockets 7 and 8 respectively. The polarizer tubing may satisfactorily be made from an alloy composition composed of 65% of copper and 35% of gunmetal. The sides 6, 6^a and 6^b are each about 8″ long with a diameter of 1¼″. The balls 6^c and 6^d are each about 2½″ in diameter on the outside and about 2″ inside, or in other words about ¼″ thickness.

9 indicates a machine for generating static electricity, and from the positive pole 9^a a wire 10 extends to the tube 6 of the polarizer and is connected electrically thereto by means of a copper band about ½″ wide and one thirty-second of an inch in thickness which is secured around the tube 6 and indicated at 11 on the drawing. To the negative pole of the static machine 9, as indicated at 9^b, a wire 12 extends upwardly through the vertical wall of the casing 4 and is secured to the spinneret tube 4^a by means of a second copper band of the same dimensions as those of the band 11. This copper band on the tube 4^a is indicated 12^b. The wire 12 is insulated from the wall 4 of the casing by means of a protecting insulating tube 12^a mounted in an opening in the casing wall.

In Fig. 2, mounted on the floor 3 is diagrammatically indicated the relative position of a receiving drum or reel 13 which is driven through a chain or belt 14 by means of a suitable source of power, such as an electric motor, 15.

The position of parts shown in Fig. 2 provides that the top of the polarizer frame is 6 feet from the bottom of the casing 4. The polarizer is likewise 6 feet from the floor 3 and the receiving reel 13 is mounted on the floor 3 and about 8 feet to one side of the polarizer.

In the operation of the apparatus and the process of the present invention, the material, which is introduced into the upper end of the casing through the pipe 4^c, and which should have a consistency of a semi-liquid condition or a viscosity substantially that of a good grade of molasses, is forced through the spinneret tubes 4^a and discharged from the lower nozzles thereof at the rate of about 1,000 feet per minute, and possibly as fast as 1,800 feet per minute. The pressure is about that of gravity. As the material leaves the spinneret tube nozzle it is guided downward as a silky filament and one end connected to the receiving member 13. In the downward movement of the filament it is guided relatively close to the polarizer member, not closer than 1″ and not further than 3″ from the polarizer. During this movement the static machine is in operation with the positive pole connected to the polarizer and the negative pole connected to the spinneret tube, and a static force approximately equivalent to .01 amperes per minute is effective at the polarizer.

As a result of the expressing action described and the subsequent treatment, the material extends from the filament tube nozzle to the receiving member for a distance of over 12 feet, during which period it is drying and being subjected to the static treatment. From an inspection of Fig. 2 of the drawing, which illustrates the polarizer spaced from and below the discharge orifice, it will be obvious that a substantial drying of the filament will have been completed during the movement from the discharge orifice to the region of the polarizer. The assistance received as a result of the electrical treatment provides a filament of particularly increased continuity and evenness. The present apparatus and process has made it possible to operate at an unusual rate of speed as compared to known pressure systems. In addition to the production of an elastic silky thread, it has been found that the denier of the thread is made remarkably certain by the use of this invention.

In mounting the spinneret tubes in the casing 4 so as to make a firm tight fit, the openings in the bottom 4^e are drilled to the exact measurment of the tubes, and the inside of the bottom 4^e is counter-sunk for

1/8" to provide a seat for the tapering 2" portion of the tubes. When the wires 12 are secured to the tubes 4^a by means of the copper band 12^b, it will be observed that the wires 12 and the bands 12^b are located in a perfectly dry chamber beneath the spacing plate 4^d, and between this latter plate and the inner upper surface of the bottom 4^e. In practice about 30 tubes are mounted in the casing 4, each according to the details described with respect to the single tube illustrated in the present drawings, and changes in the number of tubes will not depart from the scope of this invention.

To reduce the inflammability of the filaments, they may be treated in a bath of magnesium hydrosulphide at a low temperature. Other reducing salts may be satisfactorily used, but the salts mentioned are particularly desirable.

I claim:

1. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a collecting reel, a polarizer member located between said orifice and said reel, and on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, and a source of electricity having one pole electrically connected to said polarizer member and the other pole electrically connected to said tube.

2. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a collecting reel, a polarizer member located along the path of travel of the filament and between said orifice and said reel and spaced sufficiently distant from said orifice to effect a drying action in the filament during the travel of the filament from the orifice to the region of said polarizer, and the source of electricity having one pole connected to said polarizer member and the other pole connected to said tube.

3. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a device for collecting a filament, a polarizer member located along the path of travel of the filament material between said orifice and said collecting device and on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, and a source of static electricity having one pole electrically connected to said polarizer member and the other pole electrically connected to said tube.

4. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a device for collecting a filament, a polarizer member located along the path of travel of the filament material between said orifice and said collecting device and on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, and a source of static electricity having the positive pole electrically connected to said polarizer and the negative pole electrically connected to said tube.

5. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a polarizer member located on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, a source of electricity having one pole electrically connected to said polarizer member and the other pole electrically connected to said tube, and a filament receiving member located on a level below the level of said polarizer.

6. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a polarizer member located on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, a source of electricity having one pole electrically connected to said polarizer member and the other pole electrically connected to said tube, and a filament receiving member located on a level below the level of said polarizer, said receiving member being at least as far below said polarizer as said polarizer is below said tube.

7. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a polarizer member located on a level below the level of said discharge orifice and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, a source of electricity having one pole electrically connected to said polarizer member and the other pole electrically connected to said tube, and a filament receiving member located on a level below the level of said polarizer, said receiving member being at least as far below said polarizer as said polarizer is below said tube, and as far to one side as it is below said polarizer.

8. In apparatus for producing filaments, a polarizer member comprising a tubular frame mounted below a spinneret tube and comprising sections of tubing with spherically shaped metal members at the adjacent ends.

9. In apparatus for producing filaments, a polarizer member comprising a three

sided tubular frame supported by the free ends of two of the sides.

10. In apparatus for producing filaments, a polarizer member comprising a three sided tubular frame supported by the free ends of two of the sides, and having metal ball members connecting and holding their adjacent ends.

11. In apparatus for producing filaments, a polarizer member comprising a three sided frame formed as three sides of a rectangle and supported by the three ends of the parallel arms.

12. In apparatus for producing filaments, a polarizer member comprising a three sided frame formed as three sides of a rectangle and supported in a vertical plane by the free ends of the parallel arms.

13. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame mounted below said spinneret tube.

14. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube.

15. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms.

16. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame.

17. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame.

18. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube.

19. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube.

20. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted below said discharge orifice, and a source of electricity electrically connected to said polarizer and to said tube.

21. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said discharge orifice, and a source of electricity electrically connected to said polarizer and to said tube.

22. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said discharge orifice by the free ends of the parallel arms, and a source of electricity electrically connected to said polarizer and to said tube.

23. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame and a source of electricity electrically connected to said polarizer and to said tube.

24. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a source of electricity electrically connected to said polarizer and to said tube.

25. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame, a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube, and a source of electricity electrically connected to said polarizer and to said tube.

26. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube, and a source of electricity electrically connected to said polarizer and to said tube.

27. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted below said discharge orifice, a source of static electricity having the positive pole thereof connected to said polarizer and the negative pole connected to said tube.

28. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said discharge orifice, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

29. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said discharge orifice by the free ends of the parallel arms, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

30. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

31. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

32. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame formed as the three sides of a rectangle and supported in a vertical plane beneath said spinneret tube by the free ends of the parallel arms, the distance between said tube and said frame being at least eight times as great as the height of said frame, a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

33. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mounted in a vertical plane below said spinneret tube, the distance between said tube and said frame being at least eight times as great as the height of said frame, and a filament receiving member located on a level below the level of said frame and as far below said frame as said frame is below said tube, and a source of static electricity having a positive pole thereof connected to said polarizer and the negative pole connected to said tube.

34. In apparatus for producing filaments, a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube positioned within said casing and having the lower end thereof projecting below the lower face of said casing and the upper end thereof in ported communication with said supply pipe opening, a polarizer member comprising a three sided tubular frame mounted below said tube, a source of electricity, an electrical conductor between said source of electricity and said polarizer, and a second electrical conductor extending from said source of electricity and passing through the wall of said casing in insulated relation thereto and connected to said tube.

35. In apparatus for producing filaments, a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube positioned within said casing and having the lower end thereof projecting below the lower face of said casing and the upper end thereof in ported communication with said supply pipe opening, a polarizer member mounted below said tube and formed as a three sided frame supported in a vertical plane, a source of electricity, an electrical conductor between said source of electricity and said polarizer, and a second electrical conductor extending from said source of electricity and passing through the wall of said casing in insulated relation thereto and connected to said tube.

36. In apparatus for producing filaments, a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube positioned within said casing and having the lower end thereof projecting below the lower face of said casing and the upper end thereof in ported communication with said supply pipe opening, a polarizer member comprising a three sided tubular frame mounted

below said tube, a source of static electricity, an electrical conductor between the positive pole of said source of electricity and said polarizer, and a second electrical conductor extending from the negative pole of said source of electricity and passing through the wall of said casing in insulated relation thereto and connected to said tube.

37. In apparatus for producing filaments, a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube positioned within said casing and having the lower end thereof projecting below the lower face of said casing and the upper end thereof in ported communication with said supply pipe opening, a polarizer member mounted below said tube and formed as a three sided frame supported in a vertical plane, a source of static electricity, an electrical conductor between the positive pole of said source of electricity and said polarizer, and a second electrical conductor extending from the negative pole of said source of electricity and passing through the wall of said casing in insulated relation thereto and connected to said tube.

38. In apparatus for forming filaments, a casing having side walls and a perforate bottom, a cover plate secured to the upper end of said side walls and having an inlet opening therein for the inflow of material to be expressed, a spacing plate positioned between said inlet opening and spaced from said bottom and resting on said casing and having a liquid tight fit with respect to the side walls thereof, said spacing plate having an opening therethrough positioned in alignment with a corresponding opening in said bottom, and a filament expressing tube having a lower discharge orifice mounted in said casing and extending from said spacing plate through one opening therein and projecting through the corresponding opening in said bottom.

39. In apparatus for forming filaments, a casing having side walls and a perforate bottom, a cover plate secured to the upper end of said side walls and having an inlet opening therein for the inflow of material to be expressed, a spacing plate positioned between said inlet opening and spaced from said bottom and resting on said casing and having a liquid tight fit with respect to the side walls thereof, said spacing plate having a plurality of openings therethrough positioned in alignment with corresponding openings in said bottom, and a filament expressing tube in each aligned corresponding openings, each tube having a lower discharge orifice and mounted in said casing and extending from said spacing plate through the same and projecting beyond the corresponding opening in said bottom.

40. In apparatus for forming filaments, a casing having side walls and a perforate bottom, a cover plate secured to the upper end of said side walls and having an inlet opening therein for the inflow of material to be expressed, a spacing plate positioned between said inlet opening and spaced from said bottom and resting on said casing and having a liquid tight fit with respect to the side walls thereof, said spacing plate having an opening therethrough positioned in alignment with a corresponding opening in said bottom, a filament expressing tube having a lower discharge orifice mounted in said casing and extending from said spacing plate through one opening therein and projecting through the corresponding opening in said bottom, and a electrical conductor extending through the side wall of said casing and insulated therefrom and secured to said tube at a point between said spacing plate and said bottom.

41. The process of producing filaments which comprises expressing material in filament form from a discharge orifice, leading the filament downward past a polarizer member spaced from said orifice and in close but spaced relation to said polarizer, subjecting the filament to an electric treatment by which the polarizer is connected to the positive pole of a source of static electricity and the filament is in electrical contact with a connection from the negative pole of said source and also to a drying action between the discharge orifice and the region of said polarizer, and finally collecting the filament on a collecting device, said polarizer being located along the path of travel of the filament and between said orifice and said collecting device.

42. The process of producing filaments which comprises expressing material in filament form from a discharge orifice at the rate of at least one thousand feet per minute, leading the filament downward and past a polarizer member and in close but spaced relation thereto, subjecting the filament to an electric treatment by which the polarizer is connected to the positive pole of a source of static electricity and the filament is in electrical contact with a connection from the negative pole of said source, and finally collecting the filament on a collecting device, said polarizer being located along the path of travel of the filament and between said orifice and said collecting device.

43. The process of producing filaments which comprises expressing material in filament form from a discharge orifice, leading the filament downward and past a polarizer member located six feet below said discharge orifice and in close but spaced relation with respect to said polarizer member, subjecting the filament to an electric treatment by which the polarizer is connected to the positive pole of a source of static electricity and the filament is in electrical contact with a con-

nection from the negative pole of said source, and finally collecting the filament on a collecting device, said polarizer being located along the path of travel of the filament and between said orifice and said collecting device.

44. The process of producing filaments which comprises expressing material in filament form from a discharge orifice, leading the filament downward and past the polarizer member located six feet below said discharge orifice and in close but spaced relation with respect to said polarizer member, subjecting the filament to an electric treatment by which the polarizer is connected to the positive pole of a source of static electricity and the filament is in electrical contact with a connection from the negative pole of said source, and collecting said filament on a receiving device located as far below said polarizer as said polarizer is below said orifice.

45. The process of producing filaments which comprises expressing material in filament form from a discharge orifice, leading the filament downward and past a polarizer member and in close but spaced relation thereto, subjecting the filament to an electric treatment equivalent to .01 ampere per minute at the polarizer, the polarizer being connected to the positive pole of a source of static electricity and the filament being in electrical contact with a connection from the negative pole of said source, and collecting said filament on a receiving device located on a level below and to one side of said polarizer.

46. The process of producing filaments which comprises expressing material in filament form from a discharge orifice, leading said filament downward and past a charged polarizer member and through the electrostatic field set up thereby, effecting a substantial drying of the filament in the period of travel from said discharge orifice to the region of said polarizer, and collecting said dried filament, said polarizer member being located along the path of travel of said filament and between said orifice and the point of collection of said dried filament.

47. The process of producing filaments which comprises expressing material ir filament form from a discharge orifice, leading said filament from said discharge orifice and past a charged polarizer, effecting a substantial drying of the filament in the period of travel from said discharge orifice to the region of said polarizer, and collecting said dried filament, said polarizer member being located along the path of travel of said filament and between said orifice and the point of collection of said dried filament.

48. The process of producing filaments which comprise expressing material in filament form from a discharge orifice leading said filament from said discharge orifice downward, adjacent to and past a charged polarizer member and through the electrostatic field set up thereby, effecting a substantial drying of the filament in the period of travel from said discharge orifice to the region of said polarizer, and collecting said dried filament, said polarizer member being located along the path of travel of said filament and between said orifice and the point of collection of said dried filament.

49. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a charged polarizer member located on a level below the level of said discharge orifice, and spaced sufficiently distant therefrom to effect a drying action during the travel of a filament from the discharge orifice to the region of said polarizer, and a receiving member for the dried filament, said polarizer member being located along the path of travel of the filament and between the discharge orifice and said receiving member.

50. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a polarizer member located sufficiently distant from said discharge orifice to effect a substantial drying of the filament in its travel from said orifice to the region of said polarizer, and a filament receiving member so positioned with respect to said orifice and said polarizer as to lead the filament in close but spaced relation past said polarizer, said polarizer member being located along the path of travel of the filament and between the discharge orifice and said receiving member.

In testimony whereof I affix my signature.

JOHN ANDRÉ ROUX.