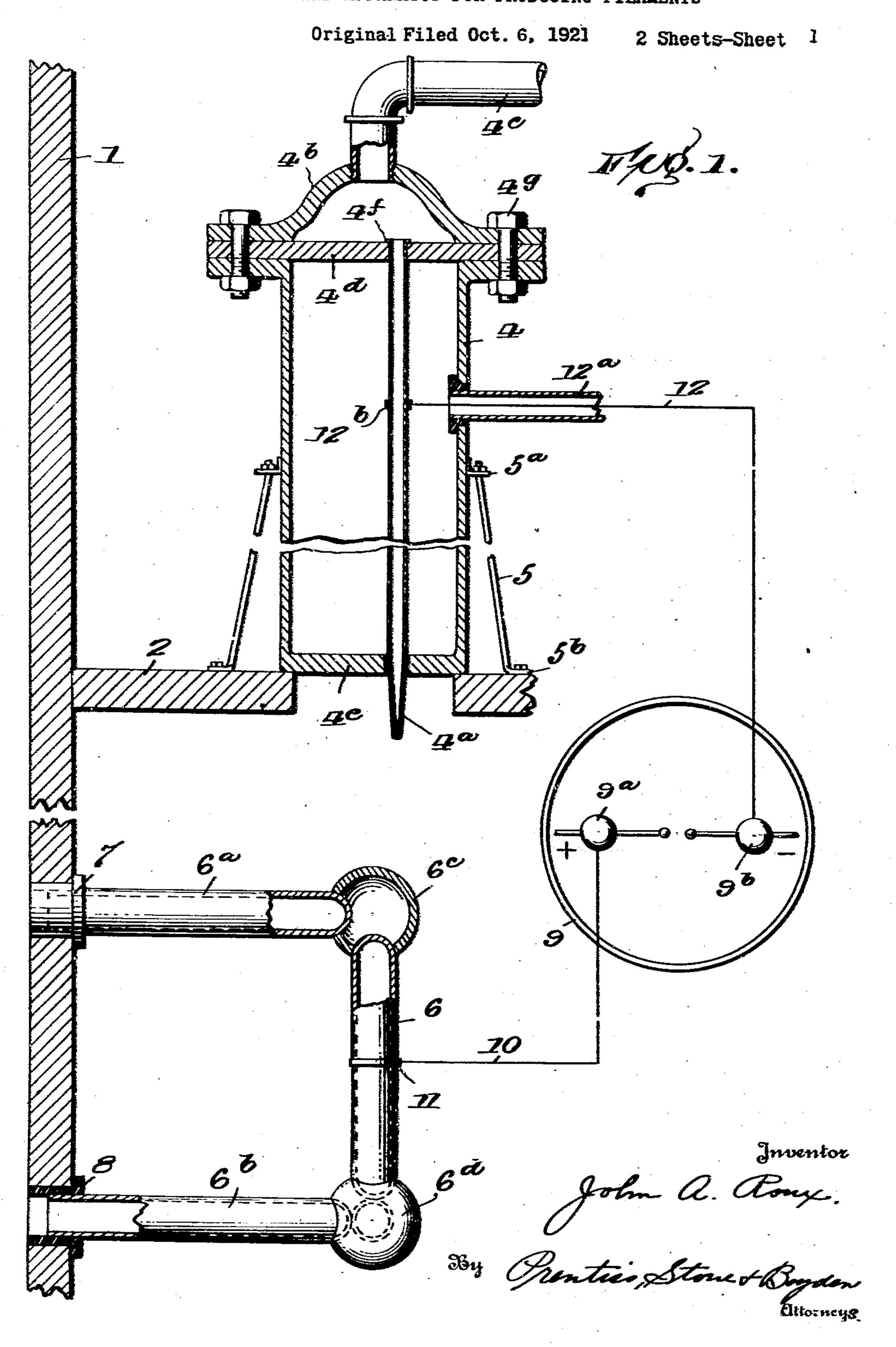
J. A. ROUX

PROCESS AND APPARATUS FOR PRODUCING FILAMENTS

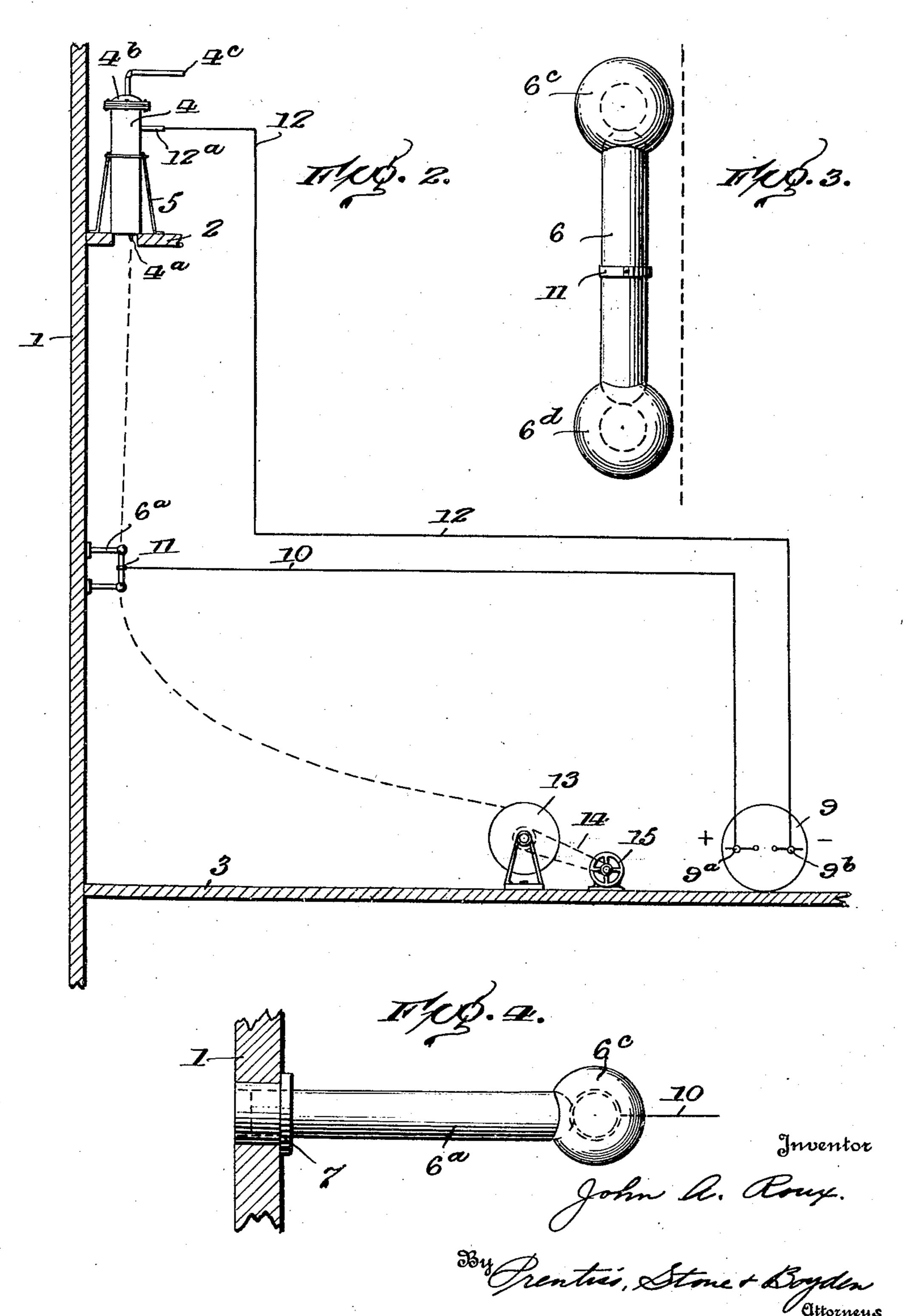


J. A. ROUX

PROCESS AND APPARATUS FOR PRODUCING FILAMENTS

Original Filed Oct. 6, 1921

2 Sheets-Sheet 2



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 is a spinneret cylinder hereinafter menand 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.

elastic stretchable artificial material.

Other advantageous features are described and claimed in the following specification 30 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 betaken by the filament in course of manufacture;

filament along side thereof; and-

in the supporting wall.

positioned over a suitable opening therein tubes 4ª are in their proper positions, the top 110

continuous lengths of material by express- tioned and claimed as the spinneret tube ening a semi-liquid material from an orifice closing casing 4. This casing is supported firmly in an upright position by means of the supporting brackets or braces 5 reaching 60 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 65 aluminum sheeting having side walls of 1/4" stock. Positioned vertically within the casing are a series of spinneret tubes 4ª having discharge orifices at their lower ends. In Fig. 1 one of these tubes is shown in section 70 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 In the present embodiment, process and the cover plate 4b is an opening for the re- 75 apparatus relate particularly to the produc- ception of the intake pipe 4°, through which tion of an artificial filament and artificial latter material to be expressed is admitted silk, which product possesses to an unusual to the casing. At the top of the vertical degree the desirable qualities of natural silk. walls of the casing 4 and resting on the lat-One particularly important result of the erally extending annular flange formed con- 80 present invention is the production of an tinuous with the wall is an upper spacing plate formed of 1/2" aluminum and which is perforated for the reception of the tubes 4ª as will be described. The bottom of the casing is provided with a 1/2" wall 4° which is 85 likewise perforated with holes to correspond with the openings in the plate 4d. Corresponding openings in the two plates are brought into alignment by adjustment of the plate 4d with respect to the casing and be- 90 fore the top cover 4^b is finally secured. Each spinneret tube 4^a is made of aluminum rolled neath the casing and the relative position evenly to have an outside diameter of 1/2". The length of the tube corresponds to the length of the casing and projects down- 95 Fig. 3 is a front view of the polarizer wardly beyond the casing floor for a disframe showing the relative position of the tance of 2", gradually tapering from the bottom of the casing to the tip of the tube. Fig. 4 represents a top view looking down The lower end of the tube is drilled to proon the polarizer and showing the manner of vide the proper size opening, and the open- 100 mounting of the ends of the polarizer frame ing provided by a No. 64 drill, providing an opening of about $\frac{1}{32}$ of an inch, has been Referring in detail to the drawings, 1 in- found satisfactory. The top part of the dicates a vertical wall of a building or spinneret tube is provided with an annular other suitable support. 2 represents the flange 4t which rests on the upper surface 105 floor of the building or other suitable lat- of the spacing plate 4d and is rolled thereon erally extending support, and 3 represents a and soldered to make a tight fit, or otherwise similar floor positioned about twelve feet be-provided with a liquid tight fit in the spacing low the floor 2. Mounted on the floor 2 and plate. After the spacing plate 4d and the

The first of the contract of t

cover 4^b is clamped to the flange on the cas- is driven through a chain or belt 14 by ing by means of suitable bolts 4g, thus secur- means of a suitable source of power, such ing the spacing plate 4d between the flange as an electric motor, 15. and the top cover. In the form illustrated, The position of parts shown in Fig. 2 5 the inside of the casing has the following provides that the top of the polarizer frame 70 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 10 on the casing 4 is about 1" wide. The top of the polarizer. cover 4b 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 4s are 15 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 posi-20 tion 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 25 in alignment with the central axle line of the casing 4. The top side of the polarizer is formed by the tube 6a, and the lower side of the polarizer is formed by the tube 6b, and both sides 6^a and 6^b are held rigid with 30 respect to the front side 6 by being mounted in the metal balls 6° and 6d respectively. 35 able 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 11/4". The balls 6° and 6d are each about 21/2" in diameter on the outside and about 2" inside, or in other words about 1/4" thickness.

9 indicates a machine for generating static copper band on the tube 4^a is indicated 12^b. 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 posi-35 tion of a receiving drum or reel 13 which

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

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°, and which should have a consistency of a 80 semi-liquid condition or a viscosity substantially that of a good grade of molasses, is forced through the spinneret tubes 4° and discharged from the lower nozzles thereof at the rate of about 1,000 feet per minute, and 85 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 mem- 90 ber 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 95 operation with the positive pole connected to The extreme ends of the parallel members the polarizer and the negative pole con-6ª and 6b are supported in the wall 1 and nected to the spinneret tube, and a static are preferably insulated therefrom by suit- force approximately equivalent to .01 amperes per minute is effective at the polar- 100 ızer.

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 electricity, and from the positive pole 9ª polarizer spaced from and below the disa wire 10 extends to the tube 6 of the polar- charge orifice, it will be obvious that a subizer and is connected electrically thereto, stantial drying of the filament will have by means of a copper band about 1/2" wide been completed during the movement from and one thirty-second of an inch in thick- the discharge orifice to the region of the ness which is secured around the tube 6 and polarizer. The assistance received as a reindicated at 11 on the drawing. To the sult of the electrical treatment provides a negative pole of the static machine 9, as in-filament of particularly increased continuity dicated at 9b, a wire 12 extends upwardly and evenness. The present apparatus and through the vertical wall of the casing 4 process has made it possible to operate at and is secured to the spinneret tube 4° by an unusual rate of speed as compared to 120 means of a second copper band of the same known pressure systems. In addition to the dimensions as those of the band 11. This production of an elastic silky thread, it has been found that the denier of the thread is The wire 12 is insulated from the wall 4 of 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° are drilled to the exact measurment of the tubes, and the inside of the bottom 4° is counter-sunk for 130 1,683,055

described with respect to the single tube il- said tube. lustrated in the present drawings, and part 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

20 particularly desirable.

I claim:

1. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a collecting reel, a polarizer member located 25 between said orifice and said reel, and on a level below the level of said discharge orifice and spaced sufficiently distant theresaid tube.

sufficiently distant from said orifice to ef-polarizer is below said tube. nected to said polarizer member and the sufficiently distant therefrom to effect a dry- 116

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 be-* low the level of said discharge orifice and below the level of said polarizer, said respaced sufficiently distant therefrom to ef- ceiving member being at least as far below region of said polarizer, and a source of said polarizer. so and the other pole electrically connected to frame mounted below a spinneret tube and 125 said tube.

a spinneret tube having a discharge orifice, ends. a device for collecting a filament, a polarizer 9. In apparatus for producing filaments,

1/8" to provide a seat for the tapering 2" the filament material between said orifice portion of the tubes. When the wires 12 and said collecting device and on a level are secured to the tubes 4° by means of the below the level of said discharge orifice and copper band 12b, it will be observed that spaced sufficiently distant therefrom to ef-5 the wires 12 and the bands 12^b are located fect a drying action during the travel of a 70 in a perfectly dry chamber beneath the spac-filament from the discharge orifice to the ing plate 4d, and between this latter plate region of said polarizer, and a source of and the inner upper surface of the bottom static electricity having the positive pole 4°. In practice about 30 tubes are mounted electrically connected to said polarizer and 10 in the casing 4, each according to the details the negative pole electrically connected to 75

5. In apparatus for producing filaments, a changes in the number of tubes will not de-spinneret tube having a discharge orifice, a polarizer member located on a level below the level of said discharge orifice and spaced 80 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 polar- 85 izer 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 90 spinneret tube having a discharge orifice, a polarizer member located on a level below from to effect a drying action during the the level of said discharge orifice and travel of a filament from the discharge ori- spaced sufficiently distant therefrom to ef-30 fice to the region of said polarizer, and a fect a drying action during the travel of a 95 source of electricity having one pole elec- filament from the discharge orifice to the trically connected to said polarizer member region of said polarizer, a source of elecand the other pole electrically connected to tricity having one pole electrically connected to said polarizer member and the 2. In apparatus for producing filaments, other pole electrically connected to said 100 a spinneret tube having a discharge orifice, tube, and a filament receiving member loa collecting reel, a polarizer member located cated on a level below the level of said along the path of travel of the filament and polarizer, said receiving member being at between said orifice and said reel and spaced least as far below said polarizer as said

fect a drying action in the filament during 7. In apparatus for producing filaments, the travel of the filament from the orifice a spinneret tube having a discharge orifice, to the region of said polarizer, and the a polarizer member located on a level below source of electricity having one pole con- the level of said discharge orifice and spaced ing 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 elec- 115. trically connected to said tube, and a filament receiving member located on a level fect a drying action during the travel of a said polarizer as said polarizer is below said 120 filament from the discharge orifice to the tube, and as far to one side as it is below

static electricity having one pole electri- 8. In apparatus for producing filaments, cally connected to said polarizer member a polarizer member comprising a tubular comprising sections of tubing with spheri-4. In apparatus for producing filaments, cally shaped metal members at the adjacent

65 member located along the path of travel of a polarizer member comprising a three 130

sided tubular frame supported by the free and a three sided tubular polarizer frame

a polarizer member comprising a three tube and said frame being at least eight 5 sided tubular frame supported by the free times as great as the height of said frame, 7 ends of two of the sides, and having metal and a filament receiving member located on ball members connecting and holding their a level below the level of said frame and as adjacent ends.

11. In apparatus for producing filaments, said tube. 10 a polarizer member comprising a three sided frame formed as three sides of a rec- a spinneret tube having a discharge orifice, tangle and supported by the three ends of a three sided tubular polarizer frame

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, charge orifice, and a source of electricity { and a three sided tubular polarizer frame electrically connected to said polarizer and

mounted below said spinneret tube.

a spinneret tube having a discharge orifice, a spinneret tube having a discharge orifice, 25 and a three sided tubular polarizer frame a three sided tubular polarizer frame (mounted in a vertical plane below said spin- formed as the three sides of a rectangle and neret tube.

a spinneret tube having a discharge orifice, allel arms, and a source of electricity elec-30 and a three sided tubular polarizer frame trically connected to said polarizer and to formed as the three sides of a rectangle and said tube. supported in a vertical plane beneath said spinneret tube by the free ends of the paral- a spinneret tube having a discharge orifice, lel arms.

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 par- great as the height of said frame and a p allel arms, the distance between said tube source of electricity electrically connected to and said frame being at least eight times said polarizer and to said tube.

a spinneret tube having a discharge orifice, a three sided tubular polarizer frame mount- 1 and a three sided tubular polarizer frame ed in a vertical plane below said spinneret mounted in a vertical plane below said spin- tube, the distance between said tube and said neret tube, the distance between said tube frame being at least eight times as great as

great as the height of said frame.

18. In apparatus for producing filaments, polarizer and to said tube. a spinneret tube having a discharge orifice, and a three sided tubular polarizer frame formed as the three sides of a rectangle and 55 supported in a vertical plane beneath said formed as the three sides of a rectangle and 1 spinneret tube by the free ends of the par-supported in a vertical plane beneath said allel arms, the distance between said tube spinneret tube by the free ends of the paraland said frame being at least eight times as lel arms, the distance between said tube and great as the height of said frame, and a said frame being at least eight times as great 60 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,

ends of two of the sides.

mounted in a vertical plane below said 10. In apparatus for producing filaments, spinneret tube, the distance between said far below said frame as said frame is below

20. In apparatus for producing filaments, 7 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 disto said tube.

14. In apparatus for producing filaments, 22. In apparatus for producing filaments, supported in a vertical plane beneath said 15. In apparatus for producing filaments, discharge orifice by the free ends of the par-

23. In apparatus for producing filaments, a three sided tubular polarizer frame 16. In apparatus for producing filaments, formed as the three sides of a rectangle and 1 a spinneret tube having a discharge orifice, 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

as great as the height of said frame.

24. In apparatus for producing filaments, 17. In apparatus for producing filaments, a spinneret tube having a discharge orifice, and said frame being at least eight times as the height of said frame, and a source of electricity electrically connected to said 1

25. In apparatus for producing filaments, a spinneret tube having a discharge orifice, a three sided tubular polarizer frame as the height of said frame, a filament re- 1 ceiving 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.

1,683,055

a spinneret tube having a discharge orifice, lel arms, the distance between said tube and a three sided tubular polarizer frame said frame being at least eight times as 5 spinneret tube, the distance between said receiving member located on a level below 70 tube and said frame being at least eight the level of said frame and as far below times as great as the height of said frame, said frame as said frame is below said tube, and a filament receiving member located on and a source of static electricity having a a level below the level of said frame and as positive pole thereof connected to said polar-10 far below said frame as said frame is below izer and the negative pole connected to said 75 said tube, and a source of electricity electrically connected to said polarizer and to said 33. In apparatus for producing filaments, tube.

15 a spinneret tube having a discharge orifice, ed in a vertical plane below said spinneret 80 a three sided tubular polarizer frame tube, the distance between said tube and said

25 charge orifice, and a source of static elec- 34. In apparatus for producing filaments, 90

pole connected to said tube. 30 a spinneret tube having a discharge orifice, face of said casing and the upper end there-95 discharge orifice by the free ends of the par-35 allel arms, and a source of static electricity electrical conductor between said source of 100 having a positive pole thereof connected to said polarizer and the negative pole con-

nected to said tube.

a spinneret tube having a discharge orifice, thereto and connected to said tube. a three sided tubular polarizer frame formed as the three sides of a rectangle and a spinneret tube enclosing casing having a supported in a vertical plane beneath said supply pipe opening, a spinneret tube posispinneret tube by the free ends of the par- tioned within said casing and having the 45 allel arms, the distance between said tube lower end thereof projecting below the lower 110 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 50 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 and a second electrical conductor extending mounted in a vertical plane below said spin- from said source of electricity and passing neret tube, the distance between said tube and said frame being at least eight times relation thereto and connected to said tube. 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. tioned within said casing and having the 125

a spinneret tube having a discharge orifice, face of said casing and the upper end therea three sided tubular polarizer frame of in ported communication with said supformed as the three sides of a rectangle and ply pipe opening, a polarizer member com-

26. In apparatus for producing filaments, spinneret tube by the free ends of the paralmounted in a vertical plane below said great as the height of said frame, a filament tube.

a spinneret tube having a discharge orifice, 27. In apparatus for producing filaments, a three sided tubular polarizer frame mountmounted below said discharge orifice, a frame being at least eight times as great source of static electricity having the posi- as the height of said frame, and a filament tive pole thereof connected to said polarizer receiving member located on a level below 20 and the negative pole connected to said tube. the level of said frame and as far below said 85 28. In apparatus for producing filaments, frame as said frame is below said tube, and a spinneret tube having a discharge orifice, a source of static electricity having a posia three sided tubular polarizer frame tive pole thereof connected to said polarizer mounted in a vertical plane below said dis- and the negative pole connected to said tube.

tricity having a positive pole thereof con- a spinneret tube enclosing casing having a nected to said polarizer and the negative supply pipe opening, a spinneret tube positioned within said casing and having the 29. In apparatus for producing filaments, lower end thereof projecting below the lower a three sided tubular polarizer frame of in ported communication with said supformed as the three sides of a rectangle and ply pipe opening, a polarizer member comsupported in a vertical plane beneath said prising a three sided tubular frame mounted below said tube, a source of electricity, an electricity and said polarizer, and a second electrical conductor extending from said source of electricity and passing through the 30. In apparatus for producing filaments, wall of said casing in insulated relation

> 35. In apparatus for producing filaments, 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 115 of electricity, an electrical conductor between said source of electricity and said polarizer, e through the wall of said casing in insulated 120

36. In apparatus for producing filaments, a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube posi-32. In apparatus for producing filaments, lower end thereof projecting below the lower supported in a vertical plane beneath said prising a three sided tubular frame mounted 130

below said tube, a source of static electricity, bottom, a cover plate secured to the upper an electrical conductor between the positive end of said side walls and having an inlet pole of said source of electricity and said opening therein for the inflow of material polarizer, and a second electrical conductor to be expressed, a spacing plate positioned s extending from the negative pole of said between said inlet opening and spaced from 70 source of electricity and passing through the said bottom and resting on said casing and wall of said casing in insulated relation having a liquid tight fit with respect to the

37. In apparatus for producing filaments, 10 a spinneret tube enclosing casing having a supply pipe opening, a spinneret tube positioned within said casing and having the ing a lower discharge orifice mounted in said lower end thereof projecting below the lower casing and extending from said spacing face of said casing and the upper end there- plate through one opening therein and pro-15 of in ported communication with said sup-jecting through the corresponding opening 80 ply 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 plate and said bottom. 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 25 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 30 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 35 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 hav-40 ing 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 which comprises expressing material in filaopenings in said bottom, and a filament ex- ment form from a discharge orifice, leading pressing tube in each aligned corresponding the filament downward and past a polarizer openings, each tube having a lower discharge member located six feet below said discharge 60 orifice and mounted in said casing and ex- orifice and in close but spaced relation with 12

thereto and connected to said tube. side walls thereof, said spacing plate having an opening therethrough positioned in alignment with a corresponding opening in 75 said bottom, a filament expressing tube havin 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

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 90 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 95 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 10 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 fila- 10 ment 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 11 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 col- 11 lecting 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 12 tending from said spacing plate through the respect to said polarizer member, subjecting same and projecting beyond the correspond- the filament to an electric treatment by which ing opening in said bottom. the polarizer is connected to the positive 40. In apparatus for forming filaments, pole of a source of static electricity and the 65 a casing having side walls and a perforate filament is in electrical contact with a con1,683,055

nection from the negative pole of said ment form from a discharge orifice, leading source, and finally collecting the filament on said filament from said discharge orifice and 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 relatact 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 fila-

past a charged polarizer, effecting a sub- 55 stantial 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 fila- 60 ment and between said orifice and the point

of collection of said dried filament.

48. The process of producing filaments which comprise expressing material in filation with respect to said polarizer member, ment form from a discharge orifice leading 65 subjecting the filament to an electric treat- said filament from said discharge orifice ment by which the polarizer is connected to downward, adjacent to and past a charged the positive pole of a source of static elec- polarizer member and through the electrotricity and the filament is in electrical con- static field set up thereby, effecting a substantial drying of the filament in the period 70 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 75 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, 80 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 85 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, 90 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 95 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 100 member.

In testimony whereof I affix my signature. JOHN ANDRÉ ROUX.