J. C. PRIMS.

APPARATUS FOR SPINNING ARTIFICIAL SILK.

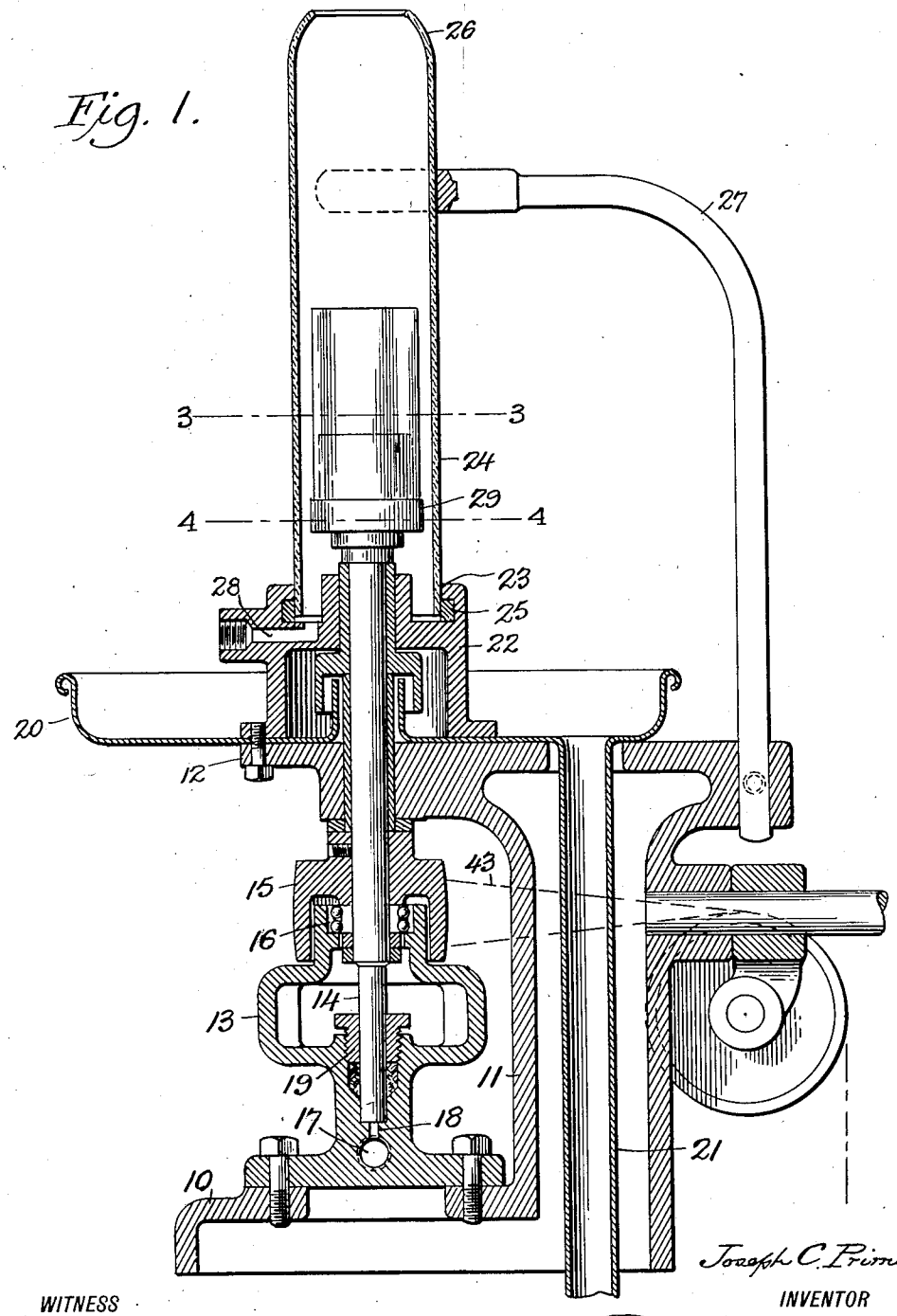
APPLICATION FILED MAY 25, 1920.

1,371,113.

Patented Mar. 8, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESS

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2 SHEETS—SHEET 2.

Fig. 2.

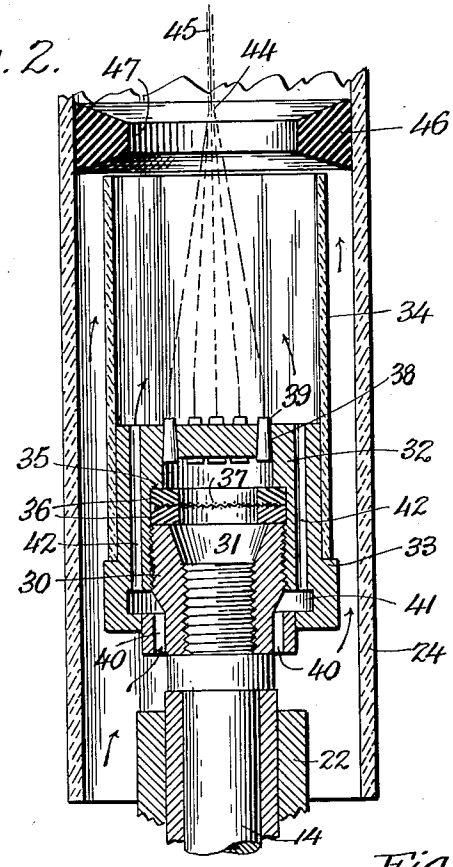


Fig. 3.

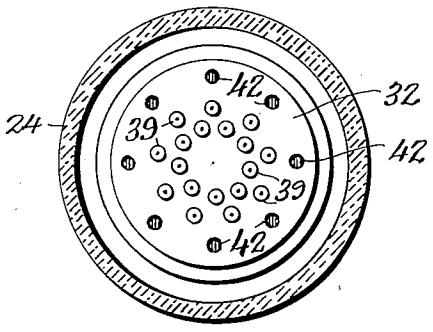
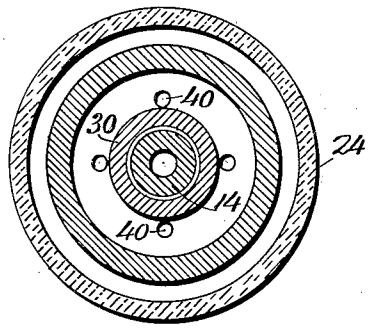


Fig. 4.



WITNESS

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SPINNING ARTIFICIAL SILK.

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Application filed May 25, 1920. Serial No. 384,063.

To all whom it may concern:

Be it known that I, JOSEPH C. PRIMS, a citizen of the United States, residing at Hornell, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Apparatus for Spinning Artificial Silk, of which the following is a specification.

This invention relates to devices for spinning artificial silk filaments or threads from viscose or other material commonly used for this purpose and has for its object the provision of a device so constructed that the coagulating solution or setting bath will be rotated along with the spinning head so as to relieve the strain imposed upon the filaments prior to their twisting into a thread, it being well known that the excessive drag of the solution upon the filaments during their most plastic condition, that is immediately after they emerge from the spinning tubes, is liable to cause breakage of the filaments and consequently cause an irregular thread.

An important and more specific object is the provision of a novel spinner head rotating within a container within which the coagulating solution is disposed, the spinner head being provided with passages through which the solution is drawn, the rotation of the spinner head having a centrifugal action and causing a whirling motion of the solution in harmony with the rotation of the spinner head and filaments issuing therefrom.

An additional object is the provision of a device of this character which is of generally different design from previously known devices of this character and which will be very compact, simple, and inexpensive in manufacture and operation, highly efficient in use, durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings in which—

Figure 1 is a longitudinal sectional view through my complete device,

Fig. 2 is an enlarged sectional view through the spinner head, *per se*.

Fig. 3 is an enlarged cross sectional view on the line 3—3 of Fig. 1, and

Fig. 4 is a cross sectional view on the line 4—4 of Fig. 1.

Referring more particularly to the drawings, I have shown my device as comprising a supporting portion 10 from which rises a standard 11 terminating at its upper end in a platform 12. Secured upon the base 10 is a bearing 13 through which is journaled a vertically disposed shaft 14, which is hollow, carrying a pulley 15 rigidly secured thereto. Interposed between the pulley and the upper end of the bearing 13 is a suitable ball bearing structure 16. Formed through the lower portion of the bearing 13 is an inlet opening 17 for the viscose or other material to be spun and leading from this opening 17 is a passage 18 communicating with the lower end of the shaft 14. A suitable packing gland 19 engages the shaft 14 for preventing leakage of the viscose from around the shaft. The shaft 14 extends a considerable distance above the platform 12, as clearly shown.

Secured upon the platform 12 is a pan 20 from the bottom of which extends a pipe 21 leading downwardly through the hollow standard 11. Secured upon the platform 12 and centrally of the pan 20, is an upright member 22 having a circular recess 23 within which is mounted a stationary preferably glass cylinder 24 packed firmly, as shown at 25. This cylinder 24 extends upwardly a considerable distance and has its upper end constricted, as shown at 26. A supporting arm 27 is connected with the platform 12 and engages the upper end of the cylinder for holding it in position.

Formed in one side of the member 22 is a passage 28 which leads into the bottom end of the cylinder 24 and which is adapted to have connected therewith any suitable pipe, not shown, for the introduction of whatever coagulating solution or setting bath it is desired to employ.

Carried by the upper end of the hollow shaft 14 is a spinner head designated broadly by the numeral 29 and this spinner head comprises an inner member 30 secured, as by threading, upon the upper extremity of the shaft 14 and at its upper portion this inner member has its bore outwardly flared,

as shown at 31, and this bore of course communicates with the bore of the hollow shaft. The spinner head also includes an outer member 32 which is suitably secured upon the inner member, as by threading, and which is formed with an annular shoulder 33 upon which is seated a preferably glass cylinder 34 which extends considerably above the upper end of the sections 30 and 32 and of the spinner head. The outer section 32 of the spinner head is formed with an inwardly extending shoulder 35 against which is disposed a pair of rubber gaskets 36 between which is held a disk 37 of fine wire gauze, the gaskets and gauze being held in position by the inner section 30 of the head.

The upper end of the outer section 32 of the head is formed with a plurality of holes 38 of any desired number and secured within these holes are spinning tubes 39 having very small bores, that is of such size that the material forced therethrough will be filament-like.

Formed in the lower end of the inner section 30 is a series of upwardly extending passages 40 which lead into an annular chamber 41 formed in the outer section 32 and formed in this outer section is a series of vertically extending passages 42 communicating with the chamber 41 and leading to the upper end of the spinner head.

The operation of the device is as follows: The shaft 14 and spinner head 29 are rotated by any desired means, as for instance by means of a suitable belt 43 engaged about the pulley 15 and driven by any suitable means. The viscose or other material to be spun is forced under pressure through the inlet 17 and passage 18 into and upwardly through the hollow shaft 14 from which it will pass into the spinner head 29 and be forced through the plurality of spinning tubes 39, issuing from the latter in the form of filaments which are brought together as indicated at 44, to define a single thread indicated at 45, which may be drawn or wound onto any suitable reeling device, not shown. The coagulating solution, which may be of any preferred or commonly used materials, is forced into the inlet 28 and will pass upwardly within the stationary cylinder 24 and will overflow the top of the same and flow or drip into the pan 20 from whence it will be returned through the pipe 21 to the reservoir from which it is drawn. As the shaft or spinner head are rotating, a portion of the coagulating solution passing into the cylinder 24 will pass through the passages 40 into the chamber 41 and from the chamber 41 upwardly through the passages 42. The solution discharged from the upper ends of these passages 42 will have a centrifugal action and will whirl in accordance with the rotation of the spinner head so that there will be little if any relative rotation of the freshly spun filaments with respect to the body of solution within the cylinder 34. In this way it will be observed that there is little strain upon the filaments until they have reached the point where they are twisted together, at which time they will have greater strength as being combined into a single strand and also as having been acted upon, that is hardened, by the solution.

It is apparent that there may be considerable disturbance in the outer cylinder 24 immediately above the rotating cylinder 34 and to overcome any difficulty which might arise from such a condition I may make use of a rubber ring 46 disposed within the outer cylinder 24 at any desired point and designed to provide a constricted opening 47.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and easily operated and controlled device for spinning artificial silk filaments, in which the arrangement is such that undue strain upon the freshly spun and consequently plastic filaments will be prevented so as to obviate danger of breakage and consequently irregularity in the thread produced.

While I have shown and described the preferred embodiment of my invention, it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A device of the character described comprising a vertically disposed hollow shaft, means for rotating said shaft, means for conducting viscose into and through said shaft, a stationary cylinder surrounding the upper portion of the shaft, means for permitting the inlet of coagulating solution into the lower end of said cylinder, and a spinner mounted on the upper end of said shaft within said cylinder, said spinner head including a head proper provided with spinner tubes and further comprising a cylindrical shell extending above the head proper, said shell being in spaced relation to said cylinder and said head proper being formed with passages communicating with the lower portion of said cylinder and with said shell to effect whirling motion of the solution within the shell.

2. A device of the character described comprising a support, a vertically disposed hollow rotatable shaft journaled through said support, a pan mounted upon said support and having a return pipe leading therefrom, said shaft being adapted to have vis-

cose forced therethrough under pressure, a stationary cylinder mounted above said pan and having inlet means for coagulating solution, and a spinner head carried by the upper end of said shaft and communicating with the interior thereof, said spinner head including a head proper provided with spinner tubes and further including a cylindrical shell extending beyond the upper end of the head proper, and the head proper being formed of a series of vertically disposed passages establishing communication between the lower portion of the cylinder and the interior of said shell.

In testimony whereof I affix my signature.

JOSEPH C. PRIMS.