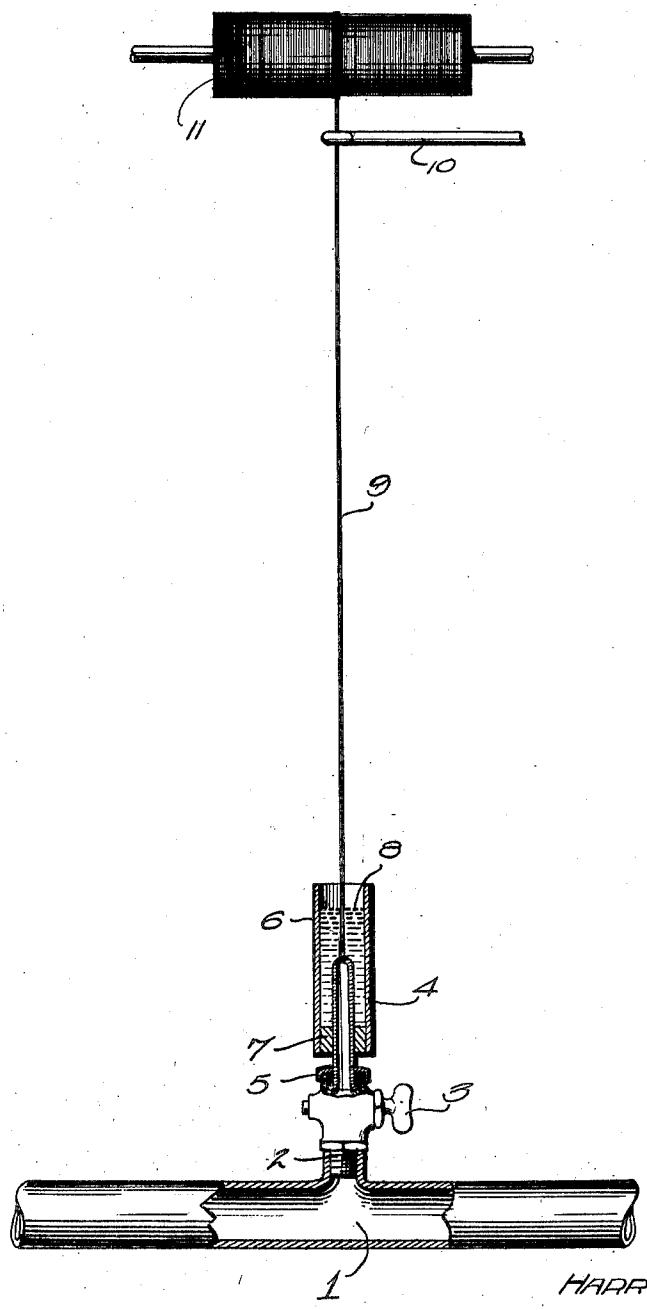
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H. P. BASSETT ET AL

PROCESS OF SPINNING ARTIFICIAL SILK AND OTHER FILAMENTS FROM CELLULOSE MATERIALS

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Inventor

HARRY P. BASSETT

THOMAS F. BANIGAN

By

Ch. Parker Attorney

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UNITED STATES PATENT OFFICE.

HARRY P. BASSETT, OF CYNTHIANA, KENTUCKY, AND THOMAS F. BANIGAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO MEIGS, BASSETT & SLAUGHTER, INC., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PROCESS OF SPINNING ARTIFICIAL SILK AND OTHER FILAMENTS FROM CELLULOSE MATERIALS.

Application filed May 17, 1923. Serial No. 639,655.

To all whom it may concern:

Be it known that we, HARRY P. BASSETT and THOMAS F. BANIGAN, citizens of the United States, residing at Cynthiana, in the county of Harrison and State of Kentucky, and Philadelphia, in the county of Philadelphia and State of Pennsylvania, respectively, have invented certain new and useful Improvements in Processes of Spinning Artificial Silk and Other Filaments from Cellulose Materials, of which the following is a specification.

This invention relates to processes of spinning artificial silk and other filaments from cellulose material, and more particularly to a modification of the ordinary dry spinning process by means of which nitro cellulose, cellulose acetate, acetyl nitro cellulose and similar materials are formed into threads or filaments.

In the usual dry spinning processes, cellulose material in solution is forced from a spinneret and delivered through a body of air to permit evaporation of the solvent in which the cellulose material is contained and is then wound on a bobbin or spool. Practically all of the solvent is removed from the cellulose material by evaporation during its passage through the body of air.

In the present invention, we provide a spinneret surrounded by a tube adapted to contain a body of a suitable liquid and the cellulose material in solution is forced through this liquid and then through a body of air for a distance considerably greater than the height of the body of liquid and then wound on the bobbin or spool.

By thus modifying the usual dry spinning process, a filament or thread more regular in cross section is obtained and it possesses greater spinning strength and elasticity during the spinning operation, permitting a wider variation of the tension of the thread during the spinning operation, without breaking the thread.

A further advantage of our process is that much finer threads may be spun by it from the same spinneret than is possible in the ordinary dry spinning process.

In the accompanying drawings, we have diagrammatically shown an apparatus particularly suitable for use in practicing the process.

In the drawings, the reference numeral 1 designates the usual feed pipe through which the solution containing the cellulose material is delivered to the spinnerets. This pipe is provided with a suitable branch 2 having a control valve 3, on its outer end. A spinneret 4 is connected to the valve casing by a suitable packing gland 5. The spinneret is surrounded by a tube 6 which is preferably from ½ to ¾ of an inch in diameter and about 4 inches long. As shown, the upper end of the spinneret is arranged intermediate the ends of the tube and preferably from 1 to 3 inches from the top of the tube. The bottom of the tube is closed by a support 7 and a body of liquid 8 is arranged therein.

The reference numeral 9 designates the thread formed which is carried upwardly through a guide 10 and wound upon a bobbin or spool 11. The distance from the top of the spinneret to the spool is from 2 to 3 feet and at least ten times the distance from the top of the spinneret to the top of the tube 6.

The process may be advanageously employed in spinning threads or filaments from cellulosce material in the form of acetyl nitro cellulose described and claimed in our copending application Serial No. 638,391 filed May 11, 1923. The material passing through the feed pipe consists of a solution of acetyl nitro cellulose in acetone in which the acetyl nitro cellulose forms from 20 to 30 per cent, by weight of the total. This material is passed from the spinneret through a body of diluted acetone arranged in the tube 6. During its passage through the body of liquid, very little of the solvent is removed from the acetyl nitro cellulose. The thread leaving the top of the tube is passed through the guide 10 and wound upon the bobbin or spool 11, substantially all of the solvent being evaporated during its passage through the air. As stated, the distance from the top of the spinneret to the bottom of spool is at least ten times as great as the distance from the tip of the spinneret to the top of the liquid. The thread or filament formed is of substantially uniform cylindrical cross section as distinguished from the non-uniform thread produced in the usual dry spinning proc-

ess. We have also found that the spinning strength of the thread is materially increased and its elasticity during the spinning operation is greater, permitting greater variation in tension with less possibility of breaking the thread and the resulting disadvantages and inconvenience. In place of acetone, other liquids may be placed in the tube 6, such as water, a weak solution of alcohol, and dilute acetic acid.

Other cellulose materials such as nitro cellulose, and celulose acetate, may be formed into threads or filaments in the same manner. In spinning nitro cellulose according to the process, a mixture of alcohol and water may be substituted for the diluted acetone or a mixture of acetone and water as described above may be employed.

In spinning cellulose acetate according to the present invention, the liquid employed in the tube 6 depends upon the solvent used for the cellulose acetate. Where the cellulose acetate is dissolved in a solution of acetone, a mixture of acetone and water may be employed in the tube 6.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

We claim:

1. The process of spinning acetyl nitro cellulose which comprises delivering a solution of acetyl nitro cellulose in acetone from a spinneret through a shallow body of acetone and water, and then delivering the thread formed through a body of air of appreciable depth.

2. The process of spinning acetyl nitro cellulose which comprises delivering a solution of acetyl nitro cellulose in acetone from a spinneret through a body of acetone and water, and then delivering the thread formed through a body of air of at least ten times the depth of the liquid.

In testimony whereof, we affix our signatures.

HARRY P. BASSETT.
THOMAS F. BANIGAN.