

UNITED STATES PATENT OFFICE.

EMILE BRONNERT, OF MULHAUSEN, FRANCE.

MANUFACTURE OF ARTIFICIAL SILK.

1,422,412.

Specification of Letters Patent. Patented July 11, 1922.

No Drawing.

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To all whom it may concern:

Be it known that I, EMILE BRONNERT, a citizen of the Republic of France, residing at Quai du Barrage, Mulhausen, Alsace-Lorraine, France, have invented certain new and useful Improvements in the Manufacture of Artificial Silk, of which the following is a specification (for which I filed applications in Germany, filed May 19th, 1919; Czecho-Slovakia, filed April 12th, 1920; Belgium, England, France, Netherlands, Italy, Norway, Austria, Sweden, Switzerland, Spain, and Hungary, filed April 30th, 1920).

This invention has reference to an improved process for the manufacture of very fine threads of highly lustrous viscose silk.

In the manufacture of artificial threads of viscose, there have been used in the past baths containing aldehyde bisulphites, oxy-methyl ester of sulphurous acid, the reduction products whereof, such as sulphoxylates, ketone bisulphites, or also condensation products from phenols or naphthols on the one side and aldehydes and sulphites on the other side with or without the addition of organic salts or sugar types.

As heretofore used these baths were only calculated for the ordinary artificial silk, with individual threads of about 7 to 8 deniers. This is apparent from the fact, that the known process makes no provision for any of the recently discovered essential steps in the process which enable threads of almost any desired fineness to be obtained when using ordinary spinning apertures of about 0.10 mm. diameter. Apart from the exact regulation of the feed of viscose to the apertures of constant size, according to the number of threads and the total titer desired, the concentration of the baths is more especially of prime importance.

As to the concentration of the baths, however in the case of bisulphite nothing has been known up to the present.

I have found that the finer it is desired to spin the more concentrated must be the bisulphite solution. These conditions are somewhat different from those existing in the case of spinning baths which contain

sulphuric acid in which the concentration must generally be inversely proportional to the square roots of the thread in denier figures.

With bisulphite baths a barely sufficient coagulative power exists, only at a relatively high concentration; but this coagulation then increases rapidly. For instance, with a concentration of 310 gr. bisulphite per litre, a thread of 7.5 deniers can be spun, but not a thread of 2 deniers, while with 360 gr. bisulphite per litre, a thread of about 2 deniers can be produced.

This highest possible concentration of 360 gr. per litre must not be diminished by additions of for example aqueous formaldehyde, but must be maintained for instance by the addition of solid bisulphite. This concentration does not suffice for the perfect spinning of still finer threads such for instance as such of from 1 to 1½ deniers. For such thread finenesses recourse must be had to the more easily soluble bisulphite of ammonium and solid salt together with an increased temperature, in order to secure a suitable concentration.

With lower concentrations and more especially with coarser single threads, the thread issuing from the bath remains brown and soluble in water.

With a higher concentration and finer single or individual threads these become more and more opalescent, doubtless in consequence of the inception of decomposition.

Viscose having a ripeness of about 8.5° (chloride of ammonium standard) with about 400 mm. spinning length and a speed of approximately 40 m. is preferably employed with these baths. The fixing is effected, when necessary with acid salts, corresponding to about 5% free acid, or directly with acid.

What I claim is:

1. The step in the process of producing very fine viscose silk threads of 6 deniers or less, which consists in forcing the viscose through the usual aperture of 0.10 mm. diameter into a precipitant bath containing a concentrated solution of easily soluble

bisulphites, the concentration of the bath being directly proportional to the fineness of the thread to be produced, so that the concentration is increased in accordance with
5 the fineness of the thread desired.

2. The process according to claim 1, characterized in that the precipitant bath contains in solution substances commonly added to precipitant baths in the manufacture of

threads of 7 deniers and upward, as set forth in the specification.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

EMILE BRONNERT.

Witnesses:

L. R. DE SALIS,
N. G. HAMBERGER.