Dec. 21, 1926. 1,611,354

K. LEUCHS

METHOD OF AND APPARATUS FOR MANUFACTURING ARTIFICIAL SILK

Filed April 12, 1926

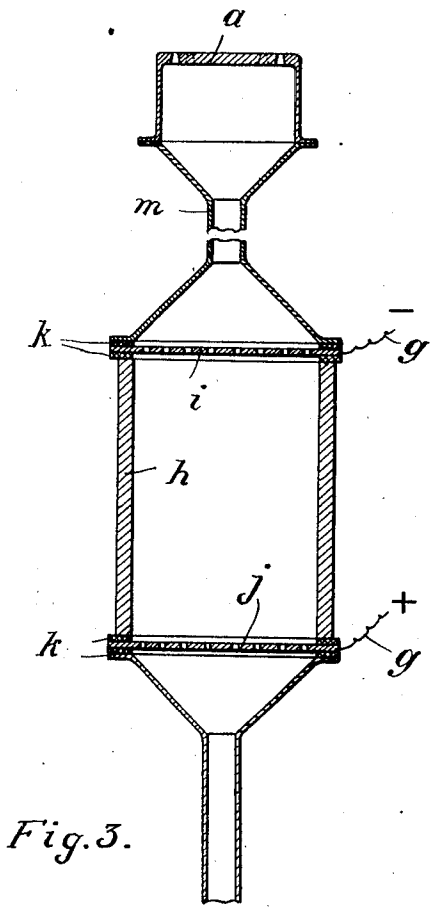

Fig. 3.

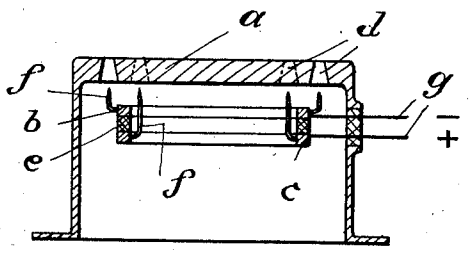

Fig. 1.

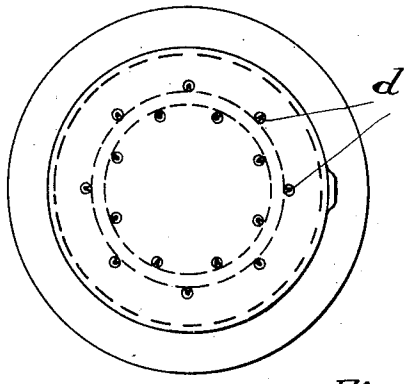

Fig. 2.

Inventor:
Karl Leuchs
by: Frank Reinhold
Attorney.

Patented Dec. 21, 1926. 1,611,354

UNITED STATES PATENT OFFICE.

KARL LEUCHS, OF BERLIN-ZEHLENDORF, GERMANY.

METHOD OF AND APPARATUS FOR MANUFACTURING ARTIFICIAL SILK.

Application filed April 12, 1926, Serial No. 101,308, and in Germany December 16, 1925.

My invention relates to improvements in the method of and apparatus for manufacturing artificial silk, bands, plates and the like from viscose. As is known to those skilled in the art when manufacturing artificial silk from viscose and the like minute air bubbles are liable to be produced in the threads unless the air is carefully removed from the viscose prior to spinning, and ordinarily the product containing such air spaces is regarded as objectionable. Further, it has been proposed systematically to produce artificial silk in which the threads contain such air cavities, for which purpose the viscose has been emulsified with air, or certain substances such as soda have been added to the viscose, which compounds, when spinning, develop a gas.

The object of the improvements is to provide a method by means of which minute cavities of uniform size are produced in the threads of the artificial silk, bands, plates and the like, and in which the size and number of the cavities can be exactly controlled. With this object in view my invention consists in producing minute gas bubbles in the viscose by electrolysis, the said bubbles being generated by electrolytic decomposition of the soda lye resulting in oxyhydrogen or hydrogen. Preferably the electrodes are located immediately before the spinning nozzles, so that the viscose having the bubbles produced therein is immediately formed into threads, and there is no time for the bubbles to combine into larger bubbles. By regulating the intensity of the current the amount of the gas developed can be exactly controlled and adapted to the flow of the viscose and the character of the threads aimed at. By providing electrodes in the form of points gas bubbles of minute and even size are produced. By being carried away by the viscose immediately after being formed the gas bubbles have not time to combine into bubbles of large and irregular size, which would result in an irregular thread.

I have found that at the anode only little oxygen is developed, most of the oxygen being consumed for oxidation of the sulfur compounds present in the viscose. This is an important feature of my method, because thereby the objectionable development of hydrogen sulfid is reduced. By reducing the density of the current at the anode the development of oxygen can be entirely avoided.

In order that the invention be more clearly understood I have shown two apparatus suitable for putting the same into effect in the accompanying drawing, in which

Fig. 1, is a sectional elevation of a nozzle,

Fig. 2, is a top-plan view of Fig. 1, and

Fig. 3, is a sectional elevation showing a modification.

In the figures I have shown only the nozzle of a spinning apparatus, the spinning apparatus and the general construction of the nozzle being known to those skilled in the art.

As shown in Figs. 1 and 2, the spinning nozzle is in the form of a cap A provided in its top wall with bores *d*, as is known in the art. Below the top of the nozzle there are two rings *b* and *c* insulated from each other by a ring *e* of a suitable insulating medium, and each ring carries a plurality of points *f* one for each of the bores *d*, and the said points are directed upwardly and towards the bores *d*. The rings *b* and *c* are connected by leads *g* to a suitable source of electric current.

In the operation of the apparatus electric current is supplied to the leads *g* and the electrodes *f*, *f*. Thereby oxygen and hydrogen are produced respectively at the ends of the points *f*, *f*, and immediately after being formed the bubbles of oxygen and hydrogen are carried away by the viscous matter pressed through the bores *d*. It will be understood that by supplying current of uniform intensity to the leads *g* and the electrodes *f*, *f* the generation of the bubbles is perfectly uniform as to the number and the size thereof, and that by regulating the current intensity the generation of the bubbles can be exactly controlled.

In Fig. 3, I have shown a modification in which the electrodes are in the form of foraminated plates or wire gauze located one behind the other in the direction of the flow of the viscous matter and stretched across the path of the viscous matter which is therefore forced to flow through the interstices of the gauze. As shown in the said figure the pipe *m* supplying the viscose to the nozzle *a* is formed with an enlarged portion comprising a cylinder *h* of glass, rubber or the like, the foraminated plates *i* and *j* being placed between the ends of the cylinder *h* and the adjacent parts of the pipe *m*. The letter *k* indicates an insulating and packing medium for the electrodes *i*, *j*. The electrodes are

connected by leads *g* to a source of electric current. In the example shown in Fig. 3 the foraminated plate or gauze *i* is the cathode, while the gauze or plate *j* remote from the nozzle *a* is the anode, so that hydrogen is generated at the electrode *i* and oxygen at the plate *j*. But I wish it to be understood that my invention is not limited to thus connecting the electrodes to the current supply.

By constructing the electrodes in the form of foraminated plates or from wire gauze the surface of the electrodes is considerably increased.

In the figures I have shown examples in which the electrodes are disposed below and comparatively near the nozzle. But I wish it to be understood that my invention is not limited to this construction.

I claim:

1. The herein described method of manufacturing artificial silk, bands, plates or the like, which consists in causing electrolysis in viscose, and thereafter forming the viscose into threads.

2. An apparatus for manufacturing artificial silk, bands, plates or the like, comprising a spinning nozzle, means for supplying viscose to said nozzle, and means for causing electrolysis in the viscose prior to delivering the same through said nozzle.

3. An apparatus for manufacturing artificial silk, bands, plates or the like, comprising a nozzle, means for supplying viscose to said nozzle, and electrodes disposed across the flow of viscose to said nozzle.

4. An apparatus for manufacturing artificial silk, bands, plates or the like, comprising a nozzle, means for supplying viscose to said nozzle, and electrodes in the form of wire gauze or foraminated plates.

In testimony whereof I hereunto affix my signature.

KARL LEUCHS.