

UNITED STATES PATENT OFFICE.

CARL RUDOLF BAUMANN, OF GAVIRATE, ITALY, AND GOTTLIEB GOTTFRIED DIESSER,
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PROCESS FOR OBTAINING SILK FIBROIN.

976,977.

Specification of Letters Patent.

Patented Nov. 29, 1910.

No Drawing.

Application filed November 27, 1908. Serial No. 464,646.

To all whom it may concern:

Be it known that we, CARL RUDOLF BAUMANN, silk manufacturer, a subject of the Swiss Confederation, residing at Gavirate, in the Kingdom of Italy, and GOTTLIEB GOTTFRIED DIESSER, scientific chemist, a subject of the German Emperor, residing at Zurich, Switzerland, have invented new and useful Improvements in Processes for Obtaining Silk Fibroin, of which improvements detailed account follows.

Besides the methods used by the silk-dyers for scouring the silk, several solvents, acid or alkaline, were hitherto known for the production of silk-fibroin. Some, or even all, of these agents however, effect a more or less fargoing decomposition of the fibroin and thus produce results which have, as it would seem, prevented, to this day, solutions of silk-fibroin from being practically made use of for technical purposes.

The present invention is the result of elaborate experiments with a great variety of solvents, experiments by which it was proved beyond doubt that an excellent method for the production of silk-fibroin, at ordinary temperatures, consisted in using formic acid as solvent, which acid has never been used to this end before.

The named solvent is especially suited for fibroin taken directly from the glands of silk worms. The fibroin of the raw silk is dissolved but very slowly, the silk thread, when treated with formic acid in the cold, swelling rather than being dissolved. It is dissolved expeditiously in formic acid, only in the presence of heat.

When the glands are dissolved in formic acid, the sericin remains an undissolved tube. The formic acid solution having been evaporated, a very lustrous thin skin of a somewhat lesser elasticity than that of the

fibroin of raw silk as obtained from the scouring trough, but having all the other qualities of the last named fibroin, has resulted. In order then to impart the degree of elasticity still wanting, a preliminary addition is made to the formic solution, of an appropriate substance, for instance, glue, fish-glue, starch, casein, dextrin, shellac, glycerin, and the like. This proceeding may perhaps shed some light on the function of the Filippi glands, which glands impart their secretion to the fibroin just before the extrusion of the latter from the organism of the silk-worm.

The capability of formic acid to dissolve fibroin can be advantageously utilized for manufacturing thin coatings, lamellæ and molded solids out of fibroin. Furthermore the swelling of the fibroin caused by its treatment with formic acid, can be utilized for manufacturing, out of silk and waste silk, insulating bodies, as bands, ribbons, sticks, plates etc., in order to utilize the great insulating power of silk. Again, finished silken fabrics can be rendered air- and waterproof by being treated with formic acid.

Claims:

1. The process of obtaining silk-fibroin, which consists in dissolving the spinning glands of silkworms with formic acid, as set forth.

2. The process of obtaining silk fibroin which consists in dissolving the spinning glands of silk worms with formic acid by the aid of heat.

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Witnesses:

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