B. LOEWE.

ART OF MAKING ARTIFICIAL SILK.

APPLICATION FILED AUG. 29, 1911.

1,151,487. Patented Aug. 24, 1915.

Fig. 1.

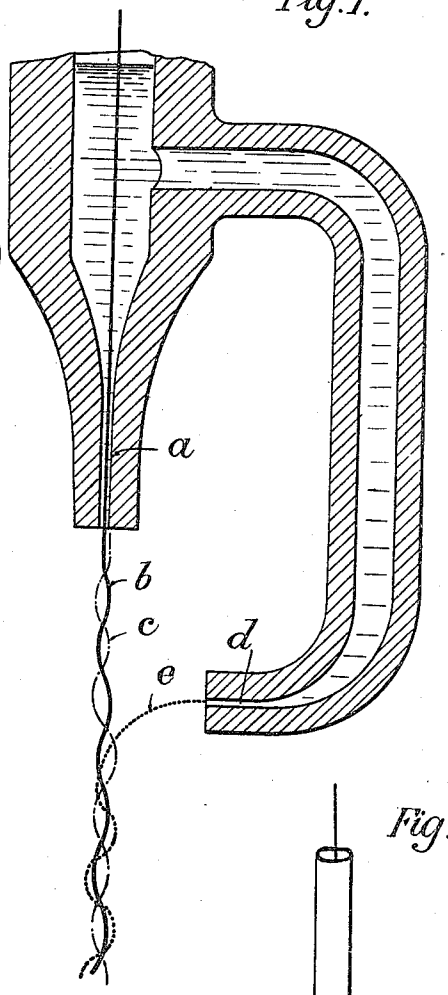


Fig. 4.

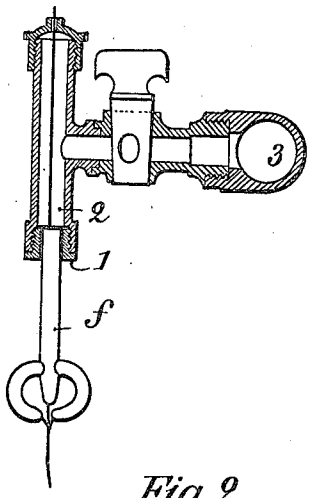


Fig. 2.

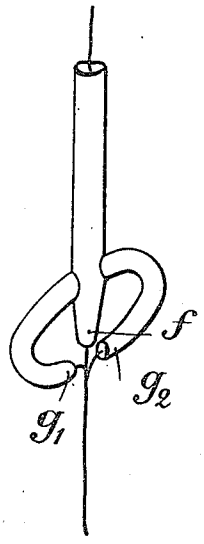
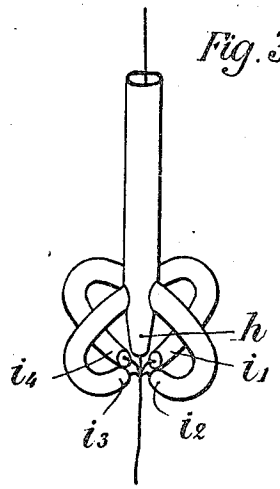


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

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ART OF MAKING ARTIFICIAL SILK.

1,151,487. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed August 29, 1911. Serial No. 646,653.

To all whom it may concern:

Be it known that I, BERNARD LOEWE, of 50 Rue Labruyère, Paris, France, manufacturer, have invented a new and useful Improvement in the Art of Making Artificial Silk, which improvement is fully set forth in the following specification.

This invention relates to improvements in the process and apparatus for the spinning of artificial silk and the glossing of natural silk and other textile fibers which form the subject of the United States application for Letters Patent filed August 13th 1909 Serial No. 512725 and of the first certificate of addition dated December 11th 1909 No. 13215 to French Patent No. 403242 of September 18th 1908.

Experience has shown that threads of natural silk (or other textile fiber) which have been glossed by the process described in the aforesaid United States application and French certificate of addition, are impregnated with the solution of cellulose or the like which is employed for glossing and take with them on leaving the die a certain quantity of the solution in the form of a filament which may subsequently be separated from the thread of natural silk by means of suitable baths. There is thus obtained an artificial raw thread with two or more strands twisted together owing to the twisting movement to which the thread is subjected as it leaves the die, as is described in the aforesaid United States application and French certificate of addition. One of these strands is formed of the thread of raw natural silk or of cocoon filaments that has been glossed and the other, or others, of filaments of artificial silk which this thread has drawn out with it.

By the utilization in accordance with the present invention of dies with several orifices, one of which, the center one, serves for the exit of the glossed thread and of the filament of artificial silk drawn out by that thread, while the others situated around it serve for the exit of the filaments of artificial silk, raw artificial thread is obtained, the filaments of artificial silk issuing from the subsidiary orifices adhering at their exit from the die to the glossed thread on which they twist themselves and with which they may become agglomerated and from which they can be subsequently separated by means of suitable baths while still remaining twisted around it. The raw artificial threads obtained in this way are extremely regular and of great strength while possessing the fineness of the natural silk. In quality and appearance they resemble the best natural silk; of which they posses many valuable properties.

The accompanying drawing, given for the sake of example, shows different forms of dies suitable for carrying out this invention.

Figure 1 is a section on an enlarged scale of a die for glossing and spinning and provided with a single supplementary orifice. Figs. 2 and 3 are perspective views of dies having respectively 2 and 4 supplementary orifices for the formation of filaments of artificial silk. Fig. 4 is a sectional elevation showing the manner of mounting the die shown in Fig. 2.

As shown diagrammatically in Fig. 1 there issue from the principal orifice a of the die a thread b of natural silk (shown by a full line) glossed in its passage through the die and also a filament c of artificial silk (represented by a dot and dash line) which is drawn out by the thread b and is twisted upon it. From the supplementary orifice d issues a filament e of artificial silk (represented by a dotted line) which twists itself upon and adheres to the threads b and c in such a way as to form an artificial thread of three strands, which may be subsequently separated by means of suitable baths as above mentioned. For these baths any solution capable of slowly dissolving the substance of the artificial thread, but sufficiently weak to act only on its surface, may be employed, the function of such bath being to simply loosen the artificial thread or filament from the thread of natural fiber. As an example of a bath of this character, a four-tenth per cent. aqueous solution of soap, to which 1½ one-thousandths of anhydrous sodium carbonate are added, is given. The compound thread is immersed in this solution for from 10 to 15 minutes, the bath having a temperature of from 80 to 100°, centigrade. The thread is not injuriously attacked under this treatment, the solution serving simply to separate or loosen the strands.

The die shown in perspective in Fig. 2 has a principal vertical orifice f and two subsidiary lateral orifices g_1, g_2; it yields a 4-strand thread, that is: one strand of glossed natural silk and three of artificial silk.

In the arrangement shown in Fig. 3 there are a main vertical orifice h and four supplementary lateral orifices i_1, i_2, i_3, i_4; this gives a thread composed of one strand of glossed natural silk and five strands of artificial silk. In these different arrangements the tension which may be applied to the thread of natural silk combined with the pressure on the solution of artificial silk behind the dies permits of spinning at a considerable speed.

It is obvious that the dies instead of having two, three or five orifices as shown in the drawing might have any other suitable number. The dies may be of any shape and composed of glass, metal or other suitable material or composite dies may be employed, formed of metal and glass. The remainder of the machine is formed as described and shown in the aforesaid United States application and French certificate of addition.

As shown in Fig. 4 the die properly so called, for example the die f, is mounted in a plug 1 fitting into the head 2 itself fixed in the pipe 3 as described in the United States application referred to.

It is necessary that the tension on the thread as it issues from the dies should be sufficient to overcome the friction due to a large extent to the bobbins from which the natural thread unwinds before entering the die. This cause of friction may be obviated and the strength and elasticity of the product thereby increased by rotating the bobbins from which the thread of natural silk unwinds at a speed equal to that of the bobbins on which the glossed thread is wound. For this purpose the frames of the silk filament bobbins may be provided with gearing by which the said bobbins may be driven at the speed desired.

By throwing and so uniting the product of the spinning of two or more raw threads there may be combined directly with the spinning the throwing into weft and organzine of one or more strands.

Claims:

1. In the art of making artificial silk, the process which consists in drawing a thread or filament of natural fiber through a die containing an artificial silk bath, and projecting an additional filament of artificial silk against the thread or filament as it issues from the die, and twisting the group composed of natural fiber and the additional filament of artificial silk as it issues from the die.

2. In the art of making artificial silk, the process which consists in drawing a thread of natural fiber through a die containing an artificial silk bath, twisting the thread as it issues from the die, and separating the filament of artificial silk formed on the surface of the natural silk by immersing the same in a solvent bath.

3. In the art of making artificial silk, the process which consists in drawing a thread or filament of natural fiber through a die containing the artificial silk bath, and projecting artificial silk against the thread or filament as it issues from the die, and twisting the group composed of a filament of natural fiber and of artificial silk, and finally separating the artificial filaments from the filament of natural fiber by a solvent bath.

4. In the art of preparing artificial silk products, a die for the formation of a combined natural and artificial silk filament, comprising a main longitudinal filament-coating orifice, in combination with one or more lateral orifices, arranged to project a filament transversely into the path of the filament issuing from the main orifice, and as it issues from the die.

5. In the art of preparing artificial silk products, a die for the formation of a combined natural and artificial silk filament, comprising a main longitudinal filament-forming orifice, in combination with one or more lateral orifices, communicating with the main orifice, arranged to project a filament transversely into the path of the filament issuing from the main orifice and as it issues from the die.

6. In the art of preparing artificial silk products, a die for the formation of a combined natural and artificial silk filament, comprising a main longitudinal filament-forming orifice, in combination with one or more lateral orifices, communicating with the main orifice, arranged to project a filament transversely into the path of the filament issuing from the main orifice, and means for twisting the filament issuing from the orifices and as it issues from the die.

7. In the art of preparing artificial silk products, a die for the formation of an artificial silk filament, comprising a main longitudinal filament-forming orifice, in combination with a lateral filament projecting orifice arranged in advance and beyond the extremity of the longitudinal orifice.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BERNARD LOEWE.

Witnesses:
H. C. Coxe,
Frederic Harlé.