

UNITED STATES PATENT OFFICE

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PROCESS OF TREATING ARTIFICIAL SILK MADE FROM VISCOSE

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My invention relates to improvements in the process of treating artificial silk from viscose.

In a copending application Ser. No. 178,012, filed by me March 24, 1927, I have described a process by means of which the treatment of the artificial silk following the formation of the thread from viscose by coagulation is carried out while the silk is in the form of a coherent mass, the said silk being either treated on a foraminated spinning spool, or in the form of an annular body obtained by spinning the thread by the centrifugal spinning process into a rotary box. The process is important for the reason that it is not necessary first to transform the spun silk into a skein and to treat the thread in the form of a skein in which it is subject to injury. As has been described in the said application, where the carrier of the body of artificial silk is made from aluminum, the said treatment of the body of silk can be carried out if the desulfurizing bath consists of diluted hot solutions of the salts of weak acids having alkaline reaction, such for example as the sodium, potassium, or ammonium salts of the acids of the acetic acid group, the carbonic acid, the boric acid, and the phosphoric acid, the most appropriate desulfurizing medium having been found to be sulfite of sodium (Na_2SO_3), which has a certain bleaching action and affects the threads in a less degree than the sulfide of sodium ordinarily used as a desulfurizing medium. By the said sulfite the sulphur is dissolved while forming sodium-thiosulfate. Since the said salts do not affect the aluminum in an appreciable way, the silk can be desulfurized and further treated on the usual spools or other carriers made from aluminum. Thus the thread can be freed of acid, desulfurized, and further treated by means of sulfuric acid and the usual softening media such as soap and oil while being on the aluminum spinning spool, or in the form of the said cylindrical body produced by the centrifugal spinning operation.

In the said copending application I have claimed my improved process as applied to the method of treating silk spun on spinning

spools, and it is my intention to cancel from the said application the claims relating to the treatment of the silk spun by the centrifugal spinning process, which modification of the process is the subject matter of the present application for patent.

As appears from the foregoing description of the process, it is not necessary to transform the silk into a skein. Further, one of the two drying operations heretofore necessary is dispensed with, because all the operations are performed without intermediate drying, and drying is necessary only at the end of the whole operation. Thus, immediately from the annular body of silk obtained by the centrifugal spinning process a thread is obtained which is ready for sale, which thread can be formed into a skein. The product thus obtained is superior to the product obtained by the method now in use, and more particularly it can be more readily spun on bobbins, because the thread has not been injured by the various operations to which it has been subjected. In my improved process the silk is practically not injured in a mechanical way, because all the operations are performed on the same apparatus, that is the carrier of the cylindrical body produced on the centrifugal spinning machine. Further, the finished thread can be directly spun on a cross-wound bobbin, a straight bobbin, and the like, so that one operation, viz. the forming of the thread into a skein, is dispensed with.

In carrying out my improved process I cause the liquids successively to flow through the body of silk by difference of pressure, for which purpose foraminated carriers are used for treating the silk. Suitable methods of causing the liquids to flow through the mass of silk by difference of pressure are known in the art. One method consists in causing the liquid to flow through the mass of silk by centrifugal action, the carrier containing the mass of silk being placed axially on a suitable support or table adapted to be rotated at high velocity, and the liquid being delivered into the body of silk and thrown outwardly therethrough and through the foraminated carrier.

I am aware that it has heretofore been proposed to pass certain liquids necessary for treating a body of silk obtained from viscose by the centrifugal spinning process through the said body by centrifugal action, and I do not claim the method of driving the liquid through the body of silk by centrifugal action per se. But what I claim is the method of treating the body of silk obtained by the centrifugal spinning process and supported on a carrier made from aluminum, in which one of the aforesaid media, and more particularly sulfite of sodium, are used for desulfurizing the silk.

In order that my invention be more clearly understood an apparatus suitable for putting the process into effect has been illustrated in the accompanying drawing, in which,

Fig. 1, is a sectional elevation of the apparatus, and

Fig. 2, is a sectional elevation showing a modification.

In Fig. 1, the cylindrical box adapted to have the thread of artificial silk coming from the spinning nozzles deposited therein has received the reference character *a*. The said box is formed with a foraminated cylindrical wall, the foraminations having been indicated by the letter *b*, and it is fixed to a base *c* formed with an axial bore *d*. After a body of silk *e* has been spun the box *a* containing the said body is placed axially on a centrifugal machine. As shown in Fig. 1, the said centrifugal machine may consist for example of a table *f* having an axial stud projecting therefrom and mounted at the top end of a spindle *h*. The said spindle is mounted in bearings *i* and *j*, and it carries a driving member which for the purpose of illustration has been shown as a pulley *k*.

Into the box *a* a pipe *m* is passed, which is formed at its bottom with bores *n* for the discharge of the liquids therethrough. So far the apparatus is known in the art.

Referring now to the novel features, the box *a* is made from aluminum, and the desulfurizing medium supplied through the pipe *m* consists of a diluted hot solution of one of the aforesaid salts such as sulfite of sodium.

In the operation of the apparatus the box *a* is placed on the table *f*, and the pipe *m* is passed downwardly into the same. Now the table *f* and the box *a* are rapidly rotated, and the baths necessary for treating the body of silk *e* are successively passed under pressure through the pipe *m*, from which they are delivered in radial direction through the bores *n*.

After the silk has thus been treated it is dried while within the box, or otherwise. Finally the finished silk is directly spun on cross-wound bobbins, straight bobbins, and the like, or it is formed into skeins, whereupon it is ready for sale.

In Fig. 2 I have shown a modification in which a box *a* adapted to have the silk spun therein is provided with a removable foraminated lining or case *o* made from aluminum. For treating the silk the case *o* is removed from the box *a* and the centrifugal spinning machine, and it is placed on a centrifugal machine similar to the one illustrated in Fig. 1, whereupon the liquids are successively passed through the body of silk while rapidly rotating the same in the manner described with reference to Fig. 1.

In this modification of the method the box *a* may be made from any suitable material.

In another modification of the process only some of the liquids are passed through the body of silk contained within the box *a* or *o*, and the artificial silk which has thus been partly treated is spun on a foraminated bobbin, whereupon the treatment is completed by passing the remaining baths through the said bobbin and the body of silk spun thereon. If the step of desulfurizing the silk is performed on the said bobbin, the bobbin is made from aluminum, and the desulfurizing medium consists of a solution of one of the aforesaid salts such as sodium sulfite.

I claim:

1. The herein described process of manufacturing artificial silk, which consists in spinning viscose by the centrifugal spinning process into a rotary box having a foraminated wall made from aluminum, and causing a diluted hot solution of a salt of a weak acid having alkaline reaction to flow through the silk and the foraminated wall of said box.

2. The herein described process of manufacturing artificial silk, which consists in spinning viscose by the centrifugal spinning process into a rotary box having a foraminated wall made from aluminum, and causing a solution of sodium sulfite to flow through the silk and the foraminated wall of said box.

In testimony whereof I hereunto affix my signature.

KARL LEUCHS.