Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

ARTIFICIAL SILK IN THE FORM OF LOOSE FIBERS

BY ROBERT DANTZER

Translated from the French by the Editor of the Textile World Record

Artificial silk has been manufactured almost wholly in the form of continuous filaments, which have been doubled to obtain a thread of the desired size or weight, this being similar to the process of reeling and doubling natural silk. In recent years attempts have been made to produce the cellulose filaments in short lengths so as to make it possible to manufacture yarn from the material by the methods ordinarily adopted in the spinning of wool, cotton and flax, which are carded, drawn and spun. Artificial silk in the loose form can also be mixed with other textile materials to produce various effects in construction and design. There are a number of different processes of manufacturing yarn from cellulose in the loose form, the idea having evidently originated with R. L'Huilier and L. Maurice (French patent 405,684, of Aug. 3, 1909 and addition Jan. 10, 1910).

The system devised by A. Bloch (French patent 447,069, Oct. 17, 1911) is a typical method of the manufacture of artificial cotton. The operation is as follows:

1. The cellulose is immersed in a slightly alkaline bath in order to remove the fatty material. The excess of water is removed by a hydro-extractor.

2. The cellulose is next bleached in a solution made up of 2 parts of chloride of lime to 1,000 parts of water. The material is then passed through a weak solution of carbonate of soda or potash. In order to avoid the presence of chloride of lime in the cellulose, the solution used for the first operation can be replaced with the following:

10 parts chloride of lime,
6 parts sulphate of alumina,
⅔ parts sulphate of magnesia,
200 parts water.

The hypochlorite thus obtained is very unstable and gives up the chlorine very easily, resulting in a rapid and perfect bleaching.

3. The cellulose is washed in running water and then hydroextracted.

4. The cellulose is dissolved in a Schweitzer reagent in the usual manner. This reagent is made in the ordinary manner, or better by passing the ammonia over copper in contact with air.

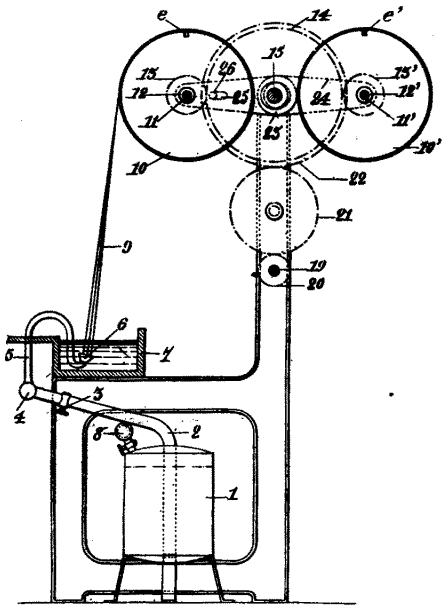


FIG. I

5. The solution of cellulose is run through a pressure filter. This is the ordinary filtering process, adding one part of castor oil to 1,000 parts of the solution.

6. The cellulose coming from the filter falls into the hydro-extractor, having a basket which is perforated with an immense number of very small holes through which the solution escapes by centrifugal force in the form of a filament. These filaments fall in a precipitating liquor consisting of water and sulphuric acid. The interior walls of this precipitating tank are covered with a

kind of card clothing with plated wire. This clothing can be removed at will. The metallic points retain the fibers and prevent them from falling to the bottom of the tank and becoming agglutinated.

The process (French patent 438,131, March 6, 1911) invented by P. Girard, differs completely from the preceding and is applicable to all kinds of artificial filaments obtained by pressure. The continuous artificial

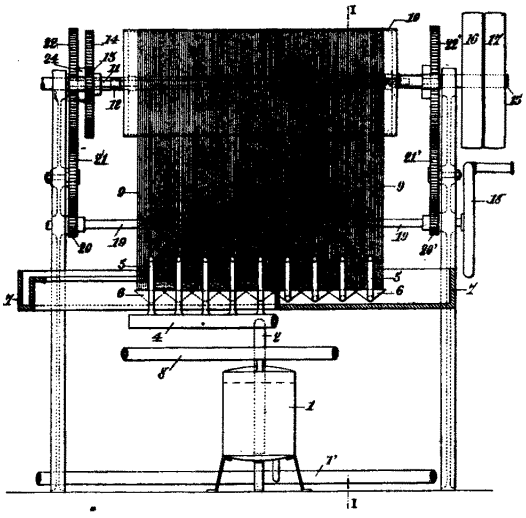


FIG. 2

filaments as they come from the machine and the coagulating baths are wound in groups on bobbins, whose diameter varies with the length of fiber desired. When a sufficient quantity of the yarn is wound it is cut from the bobbins. This produces a mass of loose fibers varying uniformly in length according to the increase in the size of the bobbins. The machine used for the Girard process is illustrated at Figs. 1, 2 and 5.

The solution of viscose which is to form the filament is stored in the tank, 1, and connected by the pipe, 2, and valve, 3, to a distributor, 4, which fits the conduits, 5, and the various filieres, 6, which are placed in the coagulating bath, 7. The pressure for forcing the viscose solution from the reservoir, 1, to the filieres, 6, is supplied by compressed air in the container, 8. The continuous filaments coming from the filieres, 6, are formed in groups, 9, the number of filaments in each group being as large as possible. On the other hand, it is an advantage to make the filament as fine as possible. This is one of the special characteristics of this process, the filaments not being heavier than two deniers.

The filaments in groups are wound on the large spool, 10, which is operated in combination with another spool, 10', to accelerate the work, one being substituted for the other when necessary. The number of pairs of spools on one machine depends on the special requirements of each case. These spools are mounted on the shafts, 11 and 11', which are connected with a sprocket chain, 24. The power is obtained from the shaft, 15, and transmitted by the gears, 13, 13' and 14. Both the spools are driven by the same gear so that a full spool can easily be replaced with an empty spool. Power is transmitted to the shaft, 15, by the chain of gears as shown.

FIG. 3

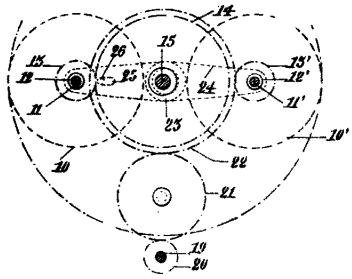
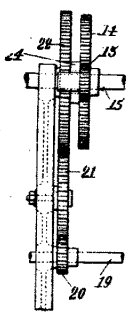


FIG. 4



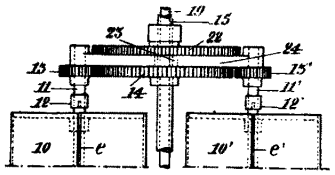


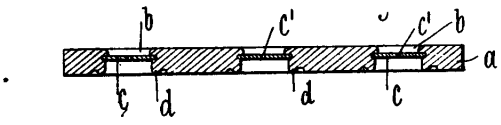
FIG. 5

The next operation is to cut the filaments from the spools. The spools, 10 and 10', Fig. 5, are made with a slit, e and e', which permits the introduction of a blade which cuts the filaments. The filieres ordinarily used are made of glass, which, as is well known, wear quite rapidly with the result that the apertures grow larger.

Fig. 2 is a front view of the machine shown in section at Fig. 1. Figs. 3 and 4 are side and end views respectively of the chain of gears.

Glass filieres will not stand over 15 days of continuous service because of the mechanical friction and the action of the alkaline solution. Gold and platinum have been used for the filieres, which are usually 5/8 inch thick. Owing to the cost of the solutions, very high pressures have been used and under these conditions the metallic filieres do not meet the requirements. The filiere invented by P. Girard and C. Buffard (French patent 442,783, April 20, 1912) is designed to overcome this difficulty. It con-

FIG 6



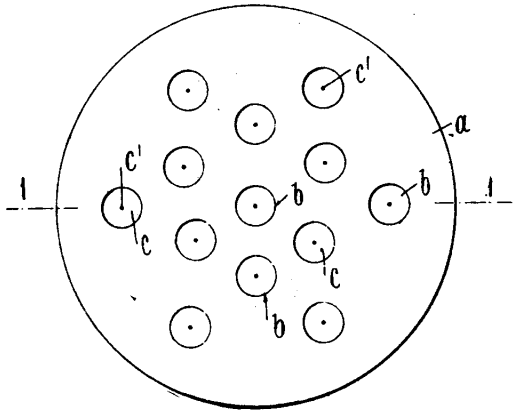


FIG. 7

sists of a support, a, Fig. 6, which is not affected by acids. The metallic plates of gold or platinum are inserted at b. These plates are pierced with a capillary hole, c', and are fixed firmly in the supports. The support, a, Figs. 6 and 7, correspond to 6, Figs. 1 and 2, the illustrations showing clearly the method of construction.

Attempts have been made to produce the artificial filament without pressure and in the open air, the viscose solution running by gravity and coagulating in the air. The process invented by G. Cahen (French patent 434,868, Dec. 8, 1910) is based on this principle and uses the following solution mixed at an ordinary temperature:

100 parts Collodion by weight,
20 parts Chloride of Alumina.
4 to 10 parts Formate of Soda,
6 parts Nitric Acid, 40° Be.,
40 to 80 parts Water.

The mixture is stirred vigorously for several hours until the mass is perfectly homogeneous and sufficiently fluid to run like a thick oil. It is left standing for several hours and then filtered. This mixture is run into filaments without pressure, possessing this property by reason of the combined action of the formate of soda, chlorine of alumina and nitrate acid. The filaments are passed through a solution of sulphohydrate of ammonia.

DEPRESSION IN THE SCOTCH-TWEED INDUSTRY

By CONSUL RUFUS FLEMING, Edinburgh

The South Scotland tweed industry, which for two or three years has been very active, is now somewhat depressed. During the last three months orders have fallen off. At the annual meeting of the Manufacturers' Corporation, in Galashiels, on October 9, it was stated by the chairman that the depression was due in some measure to the waste of capital caused by the Balkan war and the mobilization of great masses of men by Austria and Russia, but that the principal cause of the loss of trade was the decree of fashion in favor of fine Saxony makes of cloth and against cheviots, thus giving worsted manufacturers an opportunity which they were strenuously improving, while tweed manufacturers were facing a winter of poor promise.

In regard to the probable effect upon the Scotch-tweed trade of the reduction of the American tariff on woolen goods (which will take effect on Jan. 1 next), there are differences of opinion. The new American tariff is at present considered by most mill owners an uncertain element in the situation, mainly on account of (1) the free-listing of wool, which, while lowering prices to American mills, may increase prices in this market; (2) the American preference, for the time being at least, for worsted goods; and (3) the competition of cheaper English and other European cloths.