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2,953,468

PRODUCTION OF SHAPED OBJECTS FROM VISCOSE

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1 Claim. (Cl. 106—165)

This invention relates to a process for the production from viscose of artificial threads and other shaped objects, including films, having greatly improved properties as regards their resilience and their smaller degree of swelling. The invention also relates to the resulting products.

This application is a division of U.S. application Serial No. 542,767, filed October 25, 1955.

One of the principal objects of the present invention is to provide a new and improved method for spinning artificial products such as threads and other shaped objects from viscose in such manner as to confer upon them greatly improved properties as regards their strength and elasticity. A further object of the invention is to provide a new and improved method for producing product of the kind just indicated having unusually strong and well-defined peripheral zones. A still further object of the invention is to provide improved products of the kind indicated.

The manner in which these and other objects and features of the invention are attained will appear more fully from the following description thereof, in which reference is made to typical and preferred procedures in order to indicate more fully the nature of the invention, but without intending to limit the invention thereby.

A very large number of different processes have been previously proposed for the production of threads and the like with particularly good strength and elasticity values. The best results are generally obtained with threads which have a strongly developed peripheral zone. In order to produce such threads it has been considered heretofore to be essential to operate with a spinning bath having a high zinc sulphate content.

Subsequently, processes were proposed in which small amounts of monoamines were added to the viscose or in certain cases even to the spinning bath, the said monoamines being soluble in the viscose and also in the baths containing about 3–25% of zinc sulphate. The use of these processes on an industrial scale, however, presents considerable difficulties, since it is necessary to adhere exactly to predetermined amounts of these monoamines and to the other spinning conditions in order that the desired technical effect may be obtained.

According to the present invention, it has now been discovered that it is possible to operate more freely as regards the spinning conditions to be maintained and that better results are obtained as regards the qualities of the threads if small amounts of hydrazine are added to the viscose and if this viscose is thereafter spun in a bath containing 40–65 g./l. of sulphuric acid and at least 30

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g./l. of zinc sulphate. The amount of the additive is between 0.1 and 0.8% by weight.

The viscoses chosen may be those having a conventional composition with about 8% of cellulose and 6% of NaOH. It is desirable to use unripe viscoses, for example, those with a gamma value of 42 and higher.

The spinning baths preferably have substantially the following composition: 40–65 g./l. H_2SO_4 , 160–260 g./l. of Na_2SO_4 , and more than 30 g./l. $ZnSO_4$.

The bath temperature chosen is between 50 and 70° C. With an immersed travel in the bath of at least 30 cm., it is possible to operate with a withdrawal speed of 40–60 m./min. This speed may be further increased if known measures are taken to impart to the spinning bath, at least on the first part of its travel after the spinning nozzle, a speed which is substantially equal to the thread speed, so that the friction between the thread and the spinning bath is thereby substantially reduced.

The threads are subjected to a stretching by 80–120% in a second hot bath which may contain sulphuric acid. The threads have strength values of 40 g./100 den. and more.

In order to indicate still more fully the nature of the present invention, the following example of typical procedure is set forth, it being understood that this description is presented by way of illustration only, and not as limiting the scope of the invention.

Example 1

A viscose having the composition of 8.4% of cellulose, 5.8% of NaOH and 40% of CS_2 , prepared from linters, with a content of 0.14% of hydrazine (calculated on the viscose) is spun at a gamma number of 43 in a bath with the following composition: 65 g./l. of sulphuric acid, 246 g./l. of sodium sulphate and 48 g./l. of zinc sulphate. The temperature is 55° C. and the immersion path 45 cm. The withdrawal speed is about 40 m./min. The spun material is thereafter stretched by 85% in a second bath which contains 15 g./l. of H_2SO_4 and has a temperature of 90° C. The thread has a strength of 395 g./100 den. with an elongation of 18%; the degree of swelling is about 80%.

While a specific example of a preferred method and product embodying the present invention has been described above, it will be apparent that many changes and modifications may be made in the methods of procedure and the products without departing from the spirit of the invention. It will therefore be understood that the example cited and the methods and procedures set forth above are intended to be illustrative only and are not intended to limit the invention.

What is claimed is:

A viscose spinning solution containing hydrazine in the amount of 0.1–0.8% by weight based on the viscose.

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