Patented May 1, 1934 1,956,948

UNITED STATES PATENT OFFICE

1,956,948

RADIOACTIVE ARTIFICIAL FIBER

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No Drawing. Application July 19, 1932, Serial No. 623,395. In Austria June 10, 1932

2 Claims. (Cl. 106—40)

This invention relates to radioactive artificial fiber and to methods of manufacturing the same. The employment of radioactive substances for physical and technical purposes, as also for hygienic and therapeutic purposes, is widely known. It is commonly known, for instance, to employ textile fabrics as carriers of radioactive substances, for example for packings, compresses, dressing and bandaging material, and the like.

Experience has shown that it is difficult to apply radioactive matter to textile fiber in such a manner that no loss of the radioactive matter is caused by mechanical strains or by washing. The known methods hitherto adopted for combining radioactive matter with textile fiber so as to be permanently resistant to mechanical strains and the effects of washing, with the aid of impregnation, precipitation, or adhesion, have not yet produced any satisfactory solution of the problem involved. The external application or attachment with the aid of adhesives provides insufficient protection against mechanical and chemical influences. A method of effectually combining radioactive matter with the fibrous matter, as is possible in the case of the colouring matter used in dyeing, has not yet been found. With the uneven distribution of the radioactive matter effected by the known methods, it has not been possible to obtain permanent resistance to mechanical strains and the effects of washing, more particularly for the reason that with the aid of these methods the radioactive matter used is only applied more or less loosely to the surface of the fabric.

The present invention provides a method by which the radioactive matter can be uniformly commixed with the fibrous matter in such a manner that effectual protection against losses through mechanical strains and the effects of washing in the finished fabric is thereby obtained. The manufacturing of fibrous matter of the desired property, which has the necessary resistance to mechanical strains and the effects of washing, is more particularly obtained if radioactive compounds be added to the spinning solution in the process of manufacturing artificial fiber, such as, for example, artificial silk.

If insoluble radioactive admixtures be employed, care must be taken that the same are not removed to too great an extent during the filtering of the spinning solution, which can be effected by arranging for the admixture to take place after filtration or for the insoluble radioactive substance employed, e. g. radium sulphate, to be used in a state of such fine subdivision that it passes, at least for the most part, through the filter.

Tests have shown that the addition of radioactive substances to the materials used in the manufacturing of artificial fibrous matter, that is to say to the so-called spinning solution, provided it be kept within certain limits, does not impair the strength of the fiber, and results in a thread which is capable of being worked up by any known process of spinning, weaving, knitting, sewing, and the like.

If radioactive compounds be added to the precipitating liquids or dipping lyes (in the case of such methods of manufacturing artificial fibers in which such liquids are employed) with a view to rendering the finished thread radioactive, or if the attempt be made to achieve the same result by subsequent treatment with radioactive solutions, the results obtained are not so favorable as those obtained by the admixture of the radioactive substances to the spinning solution, since greater losses occur.

Under present conditions it is in practice sufficient to add up to 0.02% by weight of radioactive matter to the spinning solution, in order to obtain all the textile fabrics which are required to act as weak irradiators. If powerful irradiating action be required, the amount of radioactive matter added must be increased proportionately to the desired action. The admixture may not, however, be increased to such an extent that mechanical alteration of the structure of the filament is thereby effected which would be prejudicial to the subsequent working up of the material by spinning, weaving, knitting, sewing, and the like.

The present invention thus provides a solution of the hitherto unsolved problem of manufacturing radioactive textile fiber which is capable of being mechanically worked up and of being washed without incurring any appreciable loss of the radioactive substance incorporated therein. In contradistinction to the known forms, which contain the radioactive substances superficially distributed, the radioactive matter is in the present instance to a large extent uniformly distributed in the interior of the fiber, and is thus protected against mechanical influences and the effects of washing.

The artificial fiber thus obtained can then be worked up either alone or together with natural fibrous matter.

A practical example for the application of the described method in the manufacturing of feeble irradiators would be as follows: In the known

process for the manufacturing of artificial silk 0.001% by weight of radium sulphate is added to the spinning solution and thoroughly and uniformly mixed therewith. The further manufacturing of the fiber is effected in the usual manner.

A practical example for powerful irradiators is as follows: In the known process for the manufacturing of artificial silk 0.1% by weight of radium sulphate is added to the spinning solution and thoroughly and uniformly mixed therewith. The further manufacturing of the fiber is effected in the usual manner.

From the spinning solution to which radioactive substances have thus been added it is also possible to manufacture products of a tegumentary or paper-like nature.

We claim:

1. An artificial silk thread containing 0.001 to 0.1 percent by weight of a radium compound free to emit radioactive rays.

2. A spinning solution for the manufacture of artificial silk containing 0.001 to 0.1 percent by weight of a radium compound.

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