

UNITED STATES PATENT OFFICE

2,066,339

ARTIFICIAL MATERIALS

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No Drawing. Original application April 17, 1930,
Serial No. 445,201. Divided and this applica-
tion June 17, 1932, Serial No. 617,874

9 Claims. (Cl. 18—54)

This invention relates to the preparation of artificial filaments, yarns, bristles, straw and other artificial materials containing organic derivatives of cellulose and having a reduced lustre and other desirable properties.

This application is a division of my application S. No. 445,201 filed Apr. 17, 1930.

An object of my invention is to prepare artificial filaments, yarns or other materials of subdued lustre. A further object of my invention is to prepare artificial filaments or yarns of reduced lustre by incorporating therein finely divided starch. Further objects of my invention will appear from the following detailed description.

Artificial filaments or yarns made of organic derivatives of cellulose often have a lustre which is at times greater than desired for certain particular purposes. I have found that if finely divided starch material that is not soluble in the solvents employed in making such filaments or yarns is incorporated therein, desired opacity and lack of lustre is imparted thereto.

In accordance with my invention, I prepare textile materials such as artificial filaments or yarns by the extrusion of a spinning solution containing an organic derivative of cellulose in a suitable solvent, which solution contains finely divided starch in suspension, through orifices of appropriate size and shape into a medium causing solidification. The finely divided starch is disseminated in the filaments or yarns thus formed, and imparts thereto a desirable subdued lustre and increased opacity.

By this invention, fine filaments of say from 1 to 25 denier or more may be formed, and a plurality of such filaments may be associated together by twisting to produce yarn. Heavier filaments to be used as artificial bristles, horsehair, straw and the like of say 100 to 1000 denier or more may also be made. Other artificial materials such as foils, films and the like may also be made in accordance with this invention.

While I prefer to employ cellulose acetate as the organic derivative of cellulose for making the filaments or yarns, any suitable organic ester of cellulose such as cellulose formate, cellulose propionate or cellulose butyrate, or any suitable cellulose ether such as ethyl cellulose, methyl cellulose or benzyl cellulose may be used. In preparing the spinning solution, a suitable solvent or solvent mixture for the organic derivative of cellulose is used. Examples of such solvents or solvent mixtures are acetone, chloroform, mixtures of ethylene dichloride and ethyl

or methyl alcohol, or mixtures of dichlorethylene or ethyl or methyl alcohol. The choice of the solvent or solvent mixture will depend upon the solubility characteristics of the particular cellulose derivative employed. Generally the spinning solution contains from 15 to 35% of the organic derivative of cellulose.

In order to impart subdued lustre, opacity and other desirable characteristics to the filaments or yarns that are to be formed, there is incorporated in the spinning solution an appropriate amount of a finely divided starch material that is not soluble in the solvent of the spinning solution. The starch may be rice, corn (maize), potato, arrow root or any other suitable starch. I have found that corn (maize) starch produces particularly excellent results. The amount of finely divided starch used will vary with the nature of the material and degree of reduced lustre that is desired; generally it will be from 0.5 to 5 to 7.5% or more of the weight of the cellulose acetate present; proportions of about 3% of starch on the cellulose acetate have been found very suitable.

Any suitable means may be employed for incorporating the finely divided starch in the spinning solution. Often, in order to obtain a high degree of dispersion, the starch may be ground with the spinning solution in a ball mill or other grinding device. Often the mere addition of the finely divided starch to the spinning solution and the subsequent thorough agitation of the same is sufficient. If desired the spinning solution containing the finely divided starch may be filtered before being spun. Because of the low specific gravity of the starch employed, it remains in suspension in the spinning solution for a long time and therefore such spinning solution may be stored for a long period prior to use without danger of settling out of the suspended material.

The spinning solution containing the cellulose acetate or other organic derivative of cellulose and the finely divided starch suspended therein may be extruded through orifices into a drying evaporative atmosphere, as in dry spinning, or into a precipitating bath, as in wet spinning.

Yarns or filaments of reduced lustre and increased opacity are obtained by the process of this invention. This effect is substantially permanent and is not diminished by treatment of the yarns or filaments with hot aqueous baths, such as are employed in scouring or dyeing. When the yarns made in accordance with this invention, or fabrics containing such yarns, are

subjected to scouring with a soap solution at say 70 to 85° C. for 1 to 1½ hours, or to similar treatment, for instance, dyeing with dispersed dyestuffs in a dye bath containing soap, the products have an excellent subdued lustre. Moreover the yarns containing the starch have as great a tensile strength and elongation equal to that of yarn not containing the starch. Yarns made in accordance with this invention are particularly adapted for making hose where a subdued lustre is required.

A further advantage of this invention is due to the fact that the yarns made in accordance with this invention do not tend to cut or abrade the guides, rollers, knitting needles or other parts of textile appliances with which they come in contact during their formation or in textile operations. Yarn containing pigments or other relatively hard inorganic compounds, on the other hand, tend to cut or abrade the surfaces of such apparatus to a very large extent. A very important property of the textile materials made in accordance with this invention is the fact that the delustre effect persists, at least to a great extent, even when the materials are dyed black or dark shades. This effect is of great importance, since yarns containing inorganic pigments previously employed for delustering, acquire a high lustre when dyed in dark shades.

It is to be understood that the foregoing detailed description is given merely by way of illustration, and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. Yarns or filaments containing an organic ester of cellulose and having an increased opacity due to the presence therein, in suspension, of finely divided starch in amounts equal to 0.5 to 7.5% by weight of the organic ester of cellulose present.

2. Yarns or filaments containing cellulose acetate and having an increased opacity due to the presence therein, in suspension, of finely divided starch in amounts equal to 0.5 to 7.5% by weight of the cellulose acetate present.

3. Yarns or filaments containing an organic

ester of cellulose and having an increased opacity due to the presence therein, in suspension, of finely divided maize starch in amounts equal to 0.5 to 7.5% by weight of the cellulose acetate present.

4. A spinning solution for use in the manufacture of artificial filaments, threads, yarns, films, foils and the like which comprises an organic derivative of cellulose dissolved in an organic solvent medium and which contains, in suspension, fine particles of a starch.

5. A spinning solution for use in the manufacture of artificial filaments, threads, yarns, films, foils and the like which comprises an organic ester of cellulose dissolved in an organic solvent medium and which contains, in suspension, fine particles of maize starch.

6. A spinning solution for use in the manufacture of artificial filaments, threads, yarns, films, foils and the like which comprises cellulose acetate dissolved in an organic solvent medium and which contains, in suspension, fine particles of maize starch.

7. The process of manufacturing yarns or filaments of subdued lustre, which comprises forming artificial yarns or filaments having a basis of an organic derivative of cellulose and containing, in suspension, fine particles of a starch, and subjecting the products to a scouring operation to reduce the lustre thereof.

8. The process of manufacturing yarns or filaments of subdued lustre, which comprises extruding a solution which comprises cellulose acetate dissolved in an organic solvent medium and which contains, in suspension, fine particles of a starch through orifices into a setting medium, and subjecting the products to a scouring operation to reduce the lustre thereof.

9. The process of manufacturing yarns or filaments of subdued lustre, which comprises extruding a solution which comprises cellulose acetate dissolved in an organic solvent medium and which contains, in suspension, fine particles of maize starch through orifices into a setting medium, and subjecting the products to a scouring operation to reduce the lustre thereof.

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