

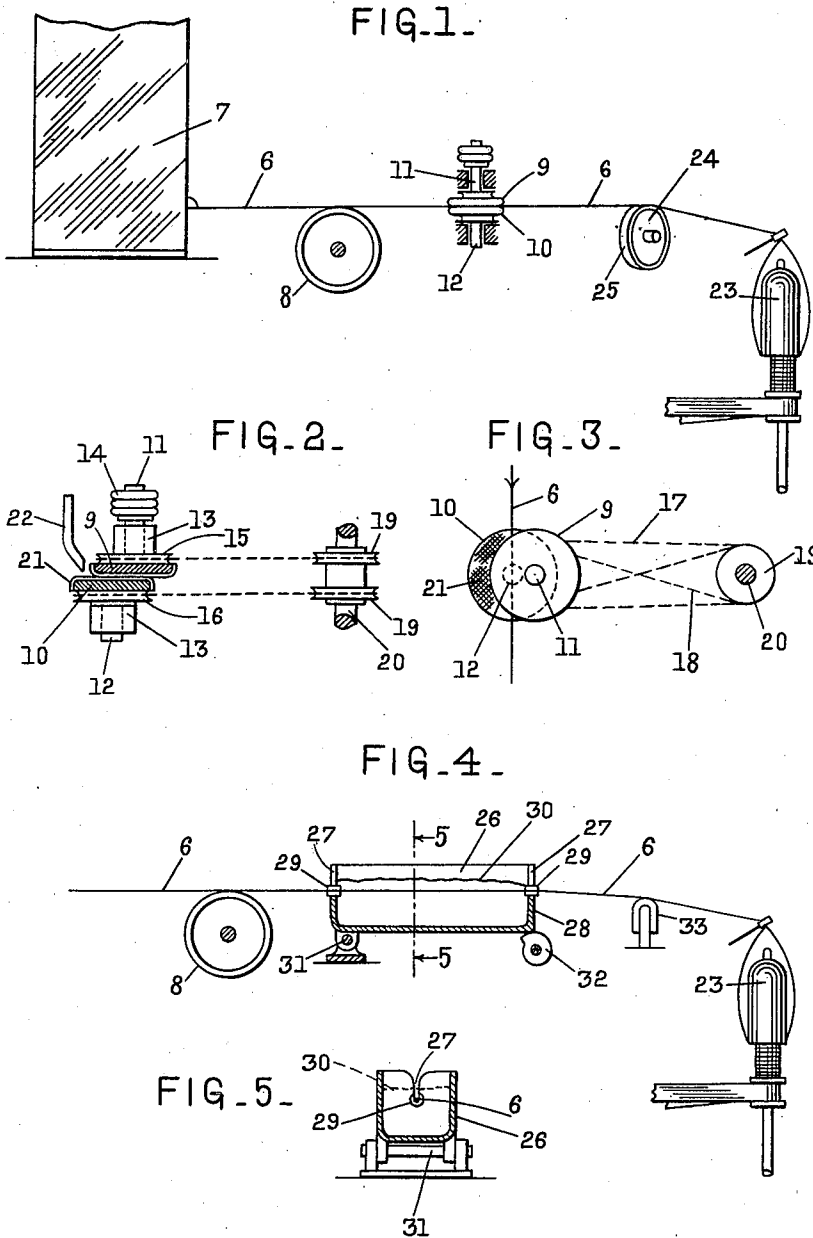
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TREATMENT OF ARTIFICIAL FILAMENTS, YARNS, OR THREADS

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TREATMENT OF ARTIFICIAL FILAMENTS,
YARNS, OR THREADSWilliam Ivan Taylor, Spondon, near Derby, Eng-
land, assignor to Celanese Corporation of
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9 Claims. (Cl. 28—59)

This invention relates to the treatment of artificial filaments, yarns, or threads, (hereinafter referred to as "threads") and comprises a new process and apparatus for delustring such threads.

5 It is well known that artificial silk and like threads frequently exhibit a high degree of lustre, which in some cases gives a metallic appearance to the threads. It has now been found that this lustre can be reduced or removed by abrading the threads, the smooth or polished surface of the threads being ground off to effect a permanent delustring of the threads. A more or less dull or matt surface can be produced by varying the intensity of the abrasion and the duration of the treatment according to the delustring required. Control over the delustring may be obtained by the choice of abrasive employed.

10 The treatment may be carried out during a winding operation or continuously with the production of the threads, e. g. during the production of cellulose acetate threads by the dry or evaporative method, and may be effected in any suitable manner, as for example, by running the thread through or over abrasive material, by passing the thread between abrasive surfaces, or by projecting abrasive on to the thread by means of an air or other fluid stream.

15 Surplus abrasive carried along by the threads may be removed by wiping the threads after abrasion.

20 Among abrasives which may be used for the purpose of the invention are kieselguhr, pumice powder, powdered glass, carborundum, and emery, kieselguhr of such a fineness that it will pass through a 120 mesh sieve having been found suitable for dulling threads of cellulose acetate.

25 Abrasives soluble in solvents having no deleterious action on the threads may be employed, so that they may be removed by treating the threads with a solvent for the abrasive, either before or after the threads are formed into fabrics or articles. Examples of water soluble abrasives are anhydrous sodium sulphate, and alum, and, though not so advantageous as the others mentioned, common salt.

30 It is possible that where the abrasion is effected by the use of powdered abrasive, the retention in the threads or filaments of embedded particles of abrasive adds to the lowness of lustre achieved by the grinding of the filament surfaces.

35 When the abrasion is effected by passing the threads between two surfaces, one or both surfaces may be of an abrasive character, or abrasive may be introduced between the surfaces.

One or both of the surfaces may be caused to move, preferably in such a manner as to rub the abrasive across the thread, and for this purpose the surfaces may take the form of rotating or otherwise moving discs or plates or endless travelling bands. Springs, weights, or other means, preferably adjustable, may be employed to press the pair of surfaces against the thread, the amount of pressure, together with the area of the surfaces in contact with the thread, determining to some extent the degree of delustring effected.

40 The rubbing surfaces are preferably fabric-covered when abrasive is introduced between them, the abrasive distributing itself evenly over the surfaces and effecting a uniform removal of the lustre of the thread. It is convenient to apply the abrasive in admixture with a liquid vehicle, such as oil or water.

45 The invention may be applied to the delustring of artificial threads of cellulose acetate or other cellulose derivatives and also to artificial threads of the reconstituted cellulose type, such as viscose, nitro-cellulose, or cuprammonium silk. The invention includes within its scope artificial filaments, yarns, or threads which have been delustred by abrasion, and also woven, knitted, or otherwise formed fabrics or articles made of or containing such filaments, yarns, or threads.

50 There will now be described with the aid of the accompanying drawing methods of delustring by passing the threads between abrasive surfaces, and by drawing the threads through powdered abrasive material, but it is to be understood that the following description is given by way of example only and is in no way limitative.

In the drawing:—

Fig. 1 is a diagrammatic view in side elevation of one form of apparatus;

55 Figs. 2 and 3 are more or less diagrammatic views of the details shown in Fig. 1;

Fig. 4 is a part sectional side elevation of a further form of apparatus; and

Fig. 5 is a cross-sectional view taken on the line 5—5 of Fig. 4.

Referring to Fig. 1, filaments 6 of cellulose acetate spun in a dry-spinning cell 7 pass round a feed roller 8 and are then taken between a pair of discs 9, 10, preferably of equal size, having an abrasive surface or between which abrasive material is introduced. The discs 9, 10 are mounted on short vertical spindles 11, 12 running in parallel, non-aligned bearings 13. A number of weights 14 may be applied to the spindle 11 so

as to press the disc 9 against the disc 10 with any desired pressure.

The discs are rotated slowly in opposite directions by means of pulleys 15, 16 driven by open and closed belts 17, 18 and pulleys 19 secured to a shaft 20 which is driven by any suitable means, e. g. from a part of the spinning apparatus, at the requisite speed. If desired, the disc 9 may be kept stationary.

The discs 9, 10 are shown covered with material 21 which may have an abrasive character, or preferably consists of fabric such as baize or felt. As will be seen from Figs. 2 and 3, a portion of the surface of the disc 10 is left uncovered by the disc 9, forming a shelf or ledge on to which abrasive may be fed, preferably continuously, by a tube 22. The abrasive may be used in dry form or mixed with oil or other liquid. For example, kieselguhr which has passed a 120 mesh sieve, may be mixed with oil, such as olive oil, and allowed to drip on to the disc 10.

The longitudinal motion of the filaments over the abrasive-charged discs, together with the more or less transverse movement of the fabric on the discs across the filaments, produces a dullness of the filament surfaces.

If desired, the filaments may be passed in turn between the faces of two or more pairs of discs until the required degree of dullness is obtained, but, in general, only one pair of discs will be found to be necessary.

After leaving the discs 9, 10 the abraded filaments 6 proceed to a winding or twisting and winding device, such as the cap-spinning apparatus 23. In order to remove surplus abrasive material carried from the discs by the filaments the filaments may be led over a flannel or other pad which may be dry or kept moistened by liquid such as alcohol, benzene, or the like, or for the same purpose a roller 24 covered with fabric 25 may be interposed in the path of the filaments, the plane of the roller 24 preferably being inclined to the path of the filaments as shown in Fig. 1 so as continually to present a new portion of the fabric 25 to the filaments. It will be understood that instead of the filaments being treated continuously with their production they may be led from any suitable supply, such as a hank or bobbin. Thus, the abrading may be performed during a bobbin-to-bobbin, hank-to-bobbin, or other winding or twisting and winding operation.

In Fig. 5 the filaments 6 after leaving the feed roller 8 are carried through a trough 26, slots 27 being provided in the ends 28 of the box to allow of the passage of the filaments, and guides 29 on the ends of the box being employed to support the filaments. Powdered abrasive material 30 is contained in the trough 26 to a height above that of the filaments passing between the guides 29 so that the filaments are continually exposed to an abrasive action as they are drawn through the material 30. In order to prevent the filaments cutting a channel through the material instead of being continually exposed to a sharp abrading action, the trough 26 is preferably arranged to be vibrated. Thus, it may be pivoted at one end as shown at 31, a slowly driven cam 32 being arranged to let the other end of the trough fall through a short distance from time to time. By this means the material 30 is kept agitated, and the filaments 6 are uniformly abraded through-

out their whole length. Surplus abrasive may be removed by means of the fabric pad 33, and before reaching the pad 33, the filaments may be passed over a revolving cloth-covered roller soaked in alcohol, benzene, or the like.

Each device may also be employed to treat a number of threads simultaneously, suitable guides being arranged, if necessary, to direct all the threads between the discs, and suitable additional pressure being applied to the discs.

The abrasive treatment may be applied to artificial filaments which already have a reduced or low lustre. For example, the artificial filaments produced according to the processes described in British patent applications Nos. 3847/29 dated 5th February 1929, 10080/29 and 10082/29 both dated 28th March 1929 may be subjected to the process according to the present invention either continuously with their production or subsequently thereto.

The expression "artificial filaments" used in the appended claims is to be understood as including yarns or threads made of or containing artificial filaments, as well as artificial filaments themselves.

What I claim and desire to secure by Letters Patent is:—

1. Process of reducing the lustre of artificial filaments, comprising drawing the filaments between and in contact with surfaces to which loose abrasive material is supplied.

2. Process of reducing the lustre of continuous artificial filaments, comprising drawing the filaments between two relatively moving abrasive surfaces.

3. Process of reducing the lustre of artificial filaments, comprising drawing the filaments between two relatively moving surfaces to which abrasive material is supplied.

4. Process of reducing the lustre of artificial filaments, comprising drawing the filaments between two relatively moving surfaces to which wet abrasive material is supplied.

5. Apparatus for reducing the lustre of artificial filaments, said apparatus comprising a pair of discs having abrasive surfaces, means for rotating at least one of the discs, and means for drawing the filaments between the discs.

6. Apparatus for reducing the lustre of artificial filaments, said apparatus comprising a pair of discs, means for rotating at least one of the discs, means for drawing the filaments between the discs, and means for supplying abrasive material to the discs.

7. Apparatus for reducing the lustre of artificial filaments, comprising a pair of discs, having abrasive surfaces, means for drawing the filaments between the discs, and means for rotating both discs about parallel axes.

8. Apparatus for reducing the lustre of artificial filaments, comprising a pair of discs, means for rotating at least one of the discs, means for drawing the filaments between the discs, means for supplying abrasive material to the discs, and means for removing surplus abrasive material from the filaments.

9. Apparatus for reducing the lustre of continuous artificial filaments, comprising a trough adapted to contain abrasive material, means for drawing the filaments through the trough and means for agitating the trough.

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