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PRODUCTION AND TREATMENT OF PACKAGES OF YARNS AND SIMILAR TEXTILE MATERIALS

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16 Claims. (Cl. 28—1)

This invention relates to improvements in the production and treatment of packages of yarns and similar textile materials.

In the production of yarns and similar textile materials, e. g. horse-hair and narrow ribbons, made, for example, of cellulose acetate or other organic derivative of cellulose, the materials are usually taken up on bobbins as they proceed, for example, from a dry spinning apparatus. The packages thus formed fit tightly on the barrel of the bobbin, and in order to remove them it is necessary to unwind the materials. They may then be taken up, for example, on swifts in order to get them into a form such as hanks which can be subjected to after-treatment processes.

I have found that this necessity for unwinding and rewinding can be avoided by coating the barrels of the bobbins, before winding the materials, with a solid substance which is removable therefrom without removing the materials.

According to the invention, therefore, I produce packages of yarn and similar textile materials on bobbins of which the barrels are coated with a solid substance which is removable therefrom without removing the textile materials, and the invention includes processes for the treatment of yarns and similar textile materials with fluid media in which use is made of such packages.

The solid substance may for example be one which is soluble or readily dispersible in a suitable liquid which is a non-solvent for the materials, for example water, toluene or ether in the case of cellulose acetate materials, or may be one which is easily fusible, e. g. a wax. Preferably it is soluble or readily dispersible in aqueous media, particularly in water. Thus, for example it may be a water-soluble carbohydrate, e. g. glucose, dextrin, cane sugar, degraded cellulose or soluble starch, or it may be a carbohydrate derivative which is soluble or dispersible in aqueous media due, for example, to degradation or to the presence of a hydrophile group in a substituent radicle. Examples of carbohydrate derivatives containing hydrophile groups in substituent radicles are hydroxyalkyl ethers of cellulose, produced, for example, according to the processes described in U. S. Patent No. 1,502,379 and British Patent No. 277,721, and carboxyalkyl ethers of cellulose, produced, for example, in the manner described in U. S. Patent No. 1,884,629. Other examples are the cellulose esters decribed in U. S. Patent No. 1,950,664 and obtainable by esterifying cellulose with dicarboxylic acids or by subjecting cellulose acetate to the action of a hydroxycarboxylic acid. Water-soluble synthetic resins, e. g. polymerized acrylic acid or partially saponified polyvinyl ester resins, or proteins which are soluble or dispersible in aqueous media, e. g. casein and gelatin, may also be employed.

If it is desired to prevent contact of the solid substance with the materials the coating may be covered with a flexible sheet material, e. g. a rubber sheeting or paper, which may be impregnated with a suitable substance to render it impervious to the substance and any liquid employed to remove it. When the bobbin is full it is then treated to remove the solid substance wholly or partially, so that the cake of yarn is left free on the bobbin and can be removed. In order to allow liquid to reach the solid substance easily the barrel of the bobbin should be perforated, while to allow the cake to be removed from the bobbin after the substance has been removed the bobbin may be provided with a detachable flange. This flange may, for example, be carried on an extension of the barrel of the bobbin which is of smaller diameter than the barrel and is screwed at the end so that after the detachable flange is placed in position on the extension it can be locked against the barrel by means of a nut. The hole through the detachable flange which fits on the extension of the barrel may be enlarged at one end to the diameter of the main portion of the barrel, so that when the flange is in position it overlaps the end of the barrel. This prevents yarn from finding its way between the flange and the barrel, as may happen if the detachable flange is merely flush with the end of the main portion of the barrel.

The bobbin itself may be made of any suitable material which is resistant to the media to which it is exposed. The material may for example be a metal, a phenol-formaldehyde or other resin or impregnated wood or pulp.

After the cake has been removed from the bobbin a suitable core may be inserted in the centre to assist it to maintain its shape. The core may for example be a slit metal cylinder which can be contracted to allow of insertion and which after insertion expands and fits sufficiently tightly to maintain the shape of the cake without interfering with the treatment operation, which may for example be shrinking, saponifying or dyeing. To assist free circulation of liquid the cylinder or other core may be perforated.

The present invention also renders it possible to carry out shrinking, saponifying or other treatment operation while the materials are still wound on the bobbin. Thus, for example, the extensibility of cellulose acetate and similar materials may be increased by treating them with shrinking agents, but if such treatments are applied to the materials while they are wound on bobbins in the ordinary way it may be difficult to obtain uniform results, since the inner layers are less free to contract than are the outer layers. By winding the materials on perforated bobbins coated with a layer of a suitable substance, and then removing the substance before or during treatment with a shrinking agent, the inner layers of the cake are rendered free to contract under the influence of the shrinking agent.

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

1. Packages of yarn and similar textile materials having a basis of cellulose acetate or other organic derivative of cellulose wound on bobbins of which the barrels are coated with a solid substance which is soluble or readily dispersible in water.

2. Packages according to claim 1, wherein the barrels of the bobbins are perforated.

3. Packages according to claim 1, wherein the bobbins are provided with a detachable flange.

4. Packages of yarn according to claim 1, wherein a flexible sheet material is interposed between the solid substance and the textile materials.

5. Process for the treatment of yarns and similar textile materials with fluid media, which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is removable therefrom without removing the textile material, to treatment to at least partially remove the solid substance before or simultaneously with the treatment with the desired fluid medium.

6. Process for the treatment of yarns and similar textile materials with fluid media, which comprises subjecting a package of yarn having a basis of cellulose acetate or other organic derivative of cellulose wound on a bobbin of which the barrel is coated with a solid substance which is soluble or readily dispersible in water, to treatment to at least partially remove the solid substance before or simultaneously with the treatment with the desired fluid medium.

7. Process for the treatment of yarns and similar textile materials with fluid media, which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is removable therefrom without removing the textile material, to treatment to at least partially remove the solid substance, thereafter removing the cake of textile material from the barrel of the bobbin and subsequently treating the cake with the desired fluid medium.

8. Process for the treatment of yarns and similar textile materials with fluid media which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is soluble or readily dispersible in water, to treatment to at least partially remove the solid substance, thereafter removing the cake of textile material from the barrel of the bobbin, and subsequently treating the cake with the desired fluid medium.

9. Process for the treatment of yarns and similar textile materials with fluid media, which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is soluble or readily dispersible in water and in which a flexible sheet material is interposed between the solid substance and the textile material, to treatment to at least partially remove the solid substance, thereafter removing the cake of textile material from the barrel of the bobbin, and subsequently treating the cake with the desired fluid medium.

10. Process according to claim 7, wherein before treating the cake with the desired fluid medium a core is inserted in the center of the cake to assist in maintaining its shape.

11. Process according to claim 8, wherein before treating the cake with the desired fluid medium a core is inserted in the center of the cake to assist in maintaining its shape.

12. Process for the treatment of yarns and similar textile materials with a shrinking medium, which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is removable therefrom without removing the textile material, to treatment to at least partially remove the solid substance before or simultaneously with the treatment with the shrinking medium.

13. Process for the treatment of yarns and similar textile materials with a shrinking medium, which comprises subjecting a package of yarn having a basis of cellulose acetate or other organic derivative of cellulose wound on a bobbin of which the barrel is coated with a solid substance which is soluble or readily dispersible in water, to treatment to at least partially remove the sclid substance before or simultaneously with the treatment with the shrinking medium.

14. Process for the treatment of yarns and similar textile materials with a shrinking medium, which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is removable therefrom without removing the textile material, to treatment to at least partially remove the solid substance, thereafter removing the cake of textile material from the barrel of the bobbin and subsequently treating the cake with the shrinking medium.

15. Process for the treatment of yarns and similar textile materials with a shrinking medium which comprises subjecting a package of yarn wound on a bobbin of which the barrel is coated with a solid substance which is soluble or readily dispersible in water, to treatment to at least partially remove the solid substance, thereafter removing the cake of textile material from the barrel of the bobbin, and subsequently treating the cake with the shrinking medium.

16. Packages of yarn and similar textile materials having a basis of cellulose acetate or other organic derivative of cellulose wound on bobbins of which the barrels are coated with a solid substance which is adapted to be readily removable from the bobbins by being soluble or readily dispersible in a liquid which is a non-solvent for the materials.

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