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TEXTILE MATERIAL

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This invention relates to improvements in yarns and in fabrics or other materials containing such yarns.

In U. S. application S. No. 119,733 filed 9th January, 1937, there is described the manufacture of composite yarn formed by doubling a length of yarn comprising filaments or fibres to which crimps have been imparted with at least one shorter length of yarn comprising uncrimped filaments or fibres so that the crimped yarn forms a spiral round the uncrimped yarn. Again, in U. S. applications S. Nos. 160,066 and 160,067 both filed 20th August, 1937, there is described the manufacture of composite yarns by doubling together one or more yarns of crinkled artificial filaments, e. g. crinkled cellulose acetate filaments, with one or more yarns capable of being shrunk relatively to the yarns of crinkled artificial filaments, e. g. crepe yarns or chemically shrinkable yarns. In each of these specifications it is stated that the yarn of crinkled artificial filaments may be of greater length than the shrinkable yarn with which it is doubled so that the yarn of crinkled artificial filaments spirals round the shrinkable yarn. The present invention relates to the production of composite yarns of the kind described in the above-mentioned specifications and for the sake of convenience the yarn of uncrimped filaments or fibres of U. S. application S. No. 119,733 filed 9th January, 1937, and the shrinkable yarn of U. S. applications S. Nos. 160,066 and 160,067 both filed 20th August, 1937, are referred to hereafter in this specification generically as the "basic yarn" of the composite product, whilst the yarn of crimped filaments or fibres of U. S. application S. No. 119,733 filed 9th January, 1937, and the yarn of crinkled artificial filaments of U. S. applications S. Nos. 160,066 and 160,067 both filed 20th August, 1937, are referred to hereafter in this specification generically as the "voluminous yarn" of the composite product.

I have now found that it is of considerable advantage in the production of such composite products to apply an adhesive size to one or more of the component yarns prior to the doubling operation and that such application of size reduces any tendency of one component to slip over another and/or enables the doubling twist applied to be quite small with resultant improvement in the voluminosity of the composite product. The size is preferably applied to the basic yarn but it may be applied instead to the voluminous yarn or to both kinds of yarn.

The size employed should be one which, at least in the form in which it is applied, is adhesive so that after the doubling operation the voluminous yarns are stuck to the basic yarns. Sizes having a basis of gelatine, starch, gums, natural or synthetic resins, water-soluble polymerised vinyl

compounds, water-soluble cellulose derivatives or drying oils may be employed and, for example, a suitable size is an aqueous composition containing 13% of gelatine, 3% of castor oil and small percentages of glycerine and sodium benzoate.

The size is preferably applied to the yarns immediately before the doubling operation so that it has little opportunity to dry on the yarn before the doubling is effected. Thus the size may very conveniently be applied continuously with the doubling operation by passing the yarn as it travels towards the doubling device through a bath of the sizing composition or in contact with a device supplied with the sizing composition, e. g. a roller or similar device.

The invention is broadly applicable to the doubling of voluminous yarns of any character with basic yarns of any character, and in connection with the types of yarns which may be employed reference is made to the specifications referred to above. Preferably the yarns are so selected and the doubling so effected that the voluminous yarn is present in the final product in greater proportion than the basic yarn. The invention is of the greatest importance where the length of the voluminous yarn is greater than the length of the basic yarn with which it is doubled, but the invention is also of value where equal lengths of the yarns are doubled together.

The doubling twist employed may be quite small since, as indicated above, it is an advantage of the present invention that it permits the use of low doubling twists, thus conserving the voluminosity of the product, whilst at the same time reducing any tendency to slippage between the voluminous yarns and the basic yarns.

The composite yarns produced according to this invention may be woven, knitted, or otherwise converted into fabric form and the size may then be removed by a scouring operation.

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

1. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist, a voluminous yarn and a basic yarn and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling operation the component yarns are stuck together.

2. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling

operation the component yarns are stuck together.

3. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn and applying an adhesive size removable by scouring to at least one of the component yarns immediately before the doubling operation so that the size has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together.

4. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist, a voluminous yarn and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected and applying an adhesive size removable by scouring to the said shrinkable yarn prior to the doubling operation, so that after the doubling operation the component yarns are stuck together.

5. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn of cellulose acetate and a basic yarn and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling operation the component yarns are stuck together.

6. Process for the production of a composite yarn which comprises doubling together by means of a doubling twist a voluminous yarn of cellulose acetate and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, and applying an adhesive size removable by scouring to the said shrinkable yarn immediately before the doubling operation so that it has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together.

7. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn, the voluminous yarn being present in greater proportion than the basic yarn and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling operation the component yarns are stuck together.

8. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, the voluminous yarn being present in a greater proportion than the basic yarn and applying an adhesive size removable by scouring to the shrinkable yarn immediately before the doubling operation so that it has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together.

9. Process for the production of a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn of cellulose acetate and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, the voluminous yarn being present in a greater proportion than the basic yarn, and

applying an adhesive size removable by scouring to the shrinkable yarn immediately before the doubling operation so that it has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together.

10. A composite yarn, comprising a voluminous yarn doubled by means of a doubling twist with a basic yarn, produced by the method set forth in claim 1.

11. A composite yarn, comprising a voluminous yarn doubled by means of a doubling twist with a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, the component yarns being stuck together by means of an adhesive size removable by scouring.

12. Process for the production of fabrics comprising a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling operation the component yarns are stuck together, subjecting the resulting composite yarn to a fabric-forming operation and thereafter removing the said size.

13. Process for the production of fabrics comprising a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected and applying an adhesive size removable by scouring to at least one of the component yarns prior to the doubling operation, so that after the doubling operation the component yarns are stuck together, subjecting the resulting composite yarn to a fabric-forming operation and thereafter removing the said size.

14. Process for the production of fabrics comprising a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn of cellulose acetate and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, and applying an adhesive size removable by scouring to the said shrinkable yarn immediately before the doubling operation so that it has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together, subjecting the resulting composite yarn to a fabric-forming operation and thereafter removing the said size.

15. Process for the production of fabrics comprising a composite yarn, which comprises doubling together by means of a doubling twist a voluminous yarn of cellulose acetate and a basic yarn which, in the finished product, is shrinkable by a treatment which leaves the voluminous yarn substantially unaffected, the voluminous yarn being present in a greater proportion than the basic yarn, and applying an adhesive size removable by scouring to the shrinkable yarn immediately before the doubling operation so that it has little opportunity to dry on the yarn before doubling is effected, with the result that after the doubling operation the component yarns are stuck together, subjecting the resulting composite yarn to a fabric-forming operation and thereafter removing the said size.

ANGUS SMITH BELL.